FLIGHT
& The AIRCRAFT ENGINEER.

First Aero Weekly in the World.
Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

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EDITORIAL COMMENT.

"Newspapers are an essential part of our war organisation."
(Sir Auckland Geddes, Minister of National Service.)

The Chevrons Question.

WE regret that so far there has been no further announcement on the question of the objectionable order relating to the wearing of active service chevrons by the officers and men of the Royal Air Force. It is to be assumed, therefore, that the Air Ministry persists in its intention to deprive the *personnel* of the R.A.F. of the distinction conferred as a reward for arduous service overseas and which, in a very large proportion of cases, was gained by its wearers in either the Navy or the Army for service which had nothing at all to do with the flying branch of either Service. As we pointed out in a previous article on the subject, the decision is a gross and distinct breach of faith with those affected by the order. The memorandum for the constitution of the Force distinctly laid down that no one was to suffer in the matter of decorations or rewards for his transfer, and yet one of the very first things that is done is to deprive officers and men of what is most certainly either a "decoration or reward" for overseas service.

We understand that one of the reasons assigned for the questionable decision is the quite farcical one that at the time officers and men qualified for the wearing of chevrons the R.A.F. did not exist, and it is thus illogical that they should be worn on the uniform of a new Service. As we say, such an argument is about the very last word in futility. Why not carry the matter to its logical conclusion, and, as well as depriving the *personnel* of their chevrons, forbid the wearing of the Mons ribbon, which equally covers a period when the R.A.F. was not in being? Indeed, we do not see why the Air Ministry should not go the whole hog and rescind the award of all honours and decorations gained prior to the constitution of the R.A.F. Or, as its powers do not extend to revision of honours granted by the Crown, at least it might be made contrary to discipline for their recipients to wear the outward and visible signs of their honours when in R.A.F. uniform. It would certainly not be a bit more absurd, nor would it be a greater injustice to those concerned, than the action which has already been taken with regard to service chevrons.

In once more raising the question we can assure the powers that be that we have not done it out of any desire to indulge in captious criticism. On the contrary, no one is more jealous of the *morale* and *esprit de corps* of the Force than we, but we know that feeling among the officers and men concerned is very strong on the subject. They feel, and we entirely agree with their point of view, that they are being treated with grave injustice and are being made the victims of bad faith. Nor is that feeling abated by the impression which is gaining ground that the action of the Ministry has been dictated by certain senior officers who have arrived at their high rank without having seen a day's service in an actual theatre of war. It is being openly said that these officers do not like to be seen with chevronless sleeves, and have managed to "wangle" matters so that everyone shall be on an equality. Whether there is anything in this or not we do not profess to know, since we have no more knowledge of the genesis of the order than the average outsider, but at least it must be acknowledged that the idea is quite as likely to be near the mark as any other. Once again we suggest to those in authority that there is only one thing to be done,

and that is to acknowledge frankly that a mistake has been made and to withdraw the objectionable order.

• • •

The German Shortage of Machines.

There is no doubt that the German aeroplane construction programme is feeling very severely the consequences of the continued heavy losses of machines at the front, and is still further badly handicapped by an increasing shortage of raw materials. One of many indications that the enemy is already feeling a serious shortage, both of machines and of trained pilots, is to be found in the fact that for the past three months German pursuit flights in France have been much below their normal establishment. During recent weeks these flights have been still further decreased, so that in many instances units with an original establishment of 18 machines have been reduced to an actual strength of only 12 machines. A strong light is thrown upon the causes of this reduction by an enemy document which has recently fallen into British hands. This order, which lays great stress upon the necessity of salving every particle of aeroplanes which are crashed behind the German lines, contains the following very significant passage :—

"In view of the present situation as regards raw material, our aeroplane industry is more and more reduced to relying on the working up of motors and instruments saved from destroyed aeroplanes. Thus the supply of material to the front has become essentially dependent upon the return of waste material from the front."

Although it would be unwise to attach too much weight to the evidence of a single document, other indications point to the fact that Germany's exceptionally heavy losses during the summer are beginning to tell. By withdrawing machines, which are badly needed, from wide sectors of the front, Germany has, it is true, been able to effect considerable aerial concentrations in the actual battle areas, but to defend adequately her long air frontier on the Rhine and in Belgium, and at the same time to maintain her battle squadrons at effective strength, is probably by this time definitely beyond her power.

Beyond the undoubted depletion of German resources, owing to the combination of causes noted, there is the fact to be taken into account that the enemy's inferiority in the air is rapidly becoming accentuated by the enormous comparative growth of the Allied power. As we have taken occasion to remark on previous occasions, not only are we actually and relatively stronger in the air than we have been at any previous period of the war, but we are only just beginning to feel the effects of our reorganised programme of construction and training. Early in the coming year, if the war should last into 1919—and it seems probable that it will—that superiority should have become well-nigh overwhelming. Again, however, it must be insisted that this supplies no reason for the slightest slackening of effort on the part of the Allies. We know that even now German military critics are showing that the superior technical resources of the Allies are causing them very serious misgivings, and they are urging their people to still further strain every nerve in the effort to restore the balance. It is for us, by corresponding effort, to show them that the race is hopelessly and irrevocably lost, and it is during the coming winter, with its comparative state of quiescence on the fighting fronts and its consequent less expenditure of material—although this year the tendency will most likely be to keep moving—that we can if we will make the necessary provision for driving the Hun out of the air in the opening campaigns of 1919.

• • •

"Drumfire" Propaganda.

It is not only in actual fighting and observation work that our aircraft on the various battle fronts are doing their share in beating the Hun. In addition to the material attack which takes the shape of bombing and machine-gunning the enemy's formations and his lines of communication and blinding his artillery, aircraft are doing magnificent work in the attack on the German *morale*. Since Lord Northcliffe took charge of propaganda in enemy countries it is obvious that much good work has been done. The recently-issued Hindenburg "manifesto" is sufficient earnest of that. In this precious document the German demi-god lets himself go in a wailing appeal to his poor-spirited fellow-countrymen not to believe the lies that are told them by the wicked Allies. Speaking of the latter he says: "He (the enemy) drenches our front not only with a drumfire of artillery, but also with a drumfire of printed matter. His airmen throw besides bombs—which kill the body—leaflets which are intended to kill the soul. Our field-greys on the Western front handed in of these enemy leaflets 84,000 in May, 120,000 in June, and 300,000 in July—10,000 poisoned arrows per day. Ten thousand times daily the attempt to take away from each and all belief in the justice of our cause and our strength for and confidence in the final victory. . . . His aeroplanes and balloons, it is true, do not carry leaflets far into the Homeland, from which the lines are remote, where the enemy is vainly struggling for victory by arms, but the enemy hopes that many a field-grey will send home the leaflet which so harmlessly fluttered down from the air."

It is indeed a worthy squeal from the people who first started this propaganda from the air. Like their raiding of open towns, it was perfectly moral and a quite legitimate form of war to endeavour to seduce the enemy's troops and people from their allegiance so long as it was only practised from the German side. It was to this sort of propaganda that the Italian reverse of last autumn was mainly traceable, and in the light of its success the Hun, quite naturally, gloried in the achievement. We do not blame him for it, since the moral factor is perfectly well recognised in war, and it is no abuse of usage to thus try to undermine the *morale* of an enemy, but it is quite in keeping with the morality—or the want of morality—of the Hun to glorify this sort of thing when it succeeds in his own hands and to describe it as the lowest and most despicable kind of tactics when the success is on the other side. Still, apart from any discussion of the ethics of the matter—and we contend that this sort of propaganda is legitimate war—it is good news that at last we are seriously making use of it, and better still that it is apparently producing such an effect on the *morale* of the Germans, both soldiers and civilians, as to have seriously frightened the enemy command. Clearly it *has* frightened them, else the Hindenburg manifesto would not have taken the shape it has. All the news that filters through from Germany tends to show that the internal state of Germany is becoming very bad and that the civilian *morale* is getting low. Even in the armies the state of discipline is very certainly not by any

means what it was a year ago. Without taking too seriously all the stories that come to us about mutinies in both army and navy and of the wholesale executions that are carried out *pour encourager les autres*, it is possible to arrive at a reasoned conclusion that all is not well with German interior economy. Now, therefore, is the time for redoubling our efforts in the propaganda line. Evidently, all the seed does not fall on stony ground, else Hindenburg would have written in a less tearful manner than he did. It is not the German fashion to appeal to the people, or to beg and pray of them to do or to refrain from doing a thing. Therefore, let the good work go on and in double measure.

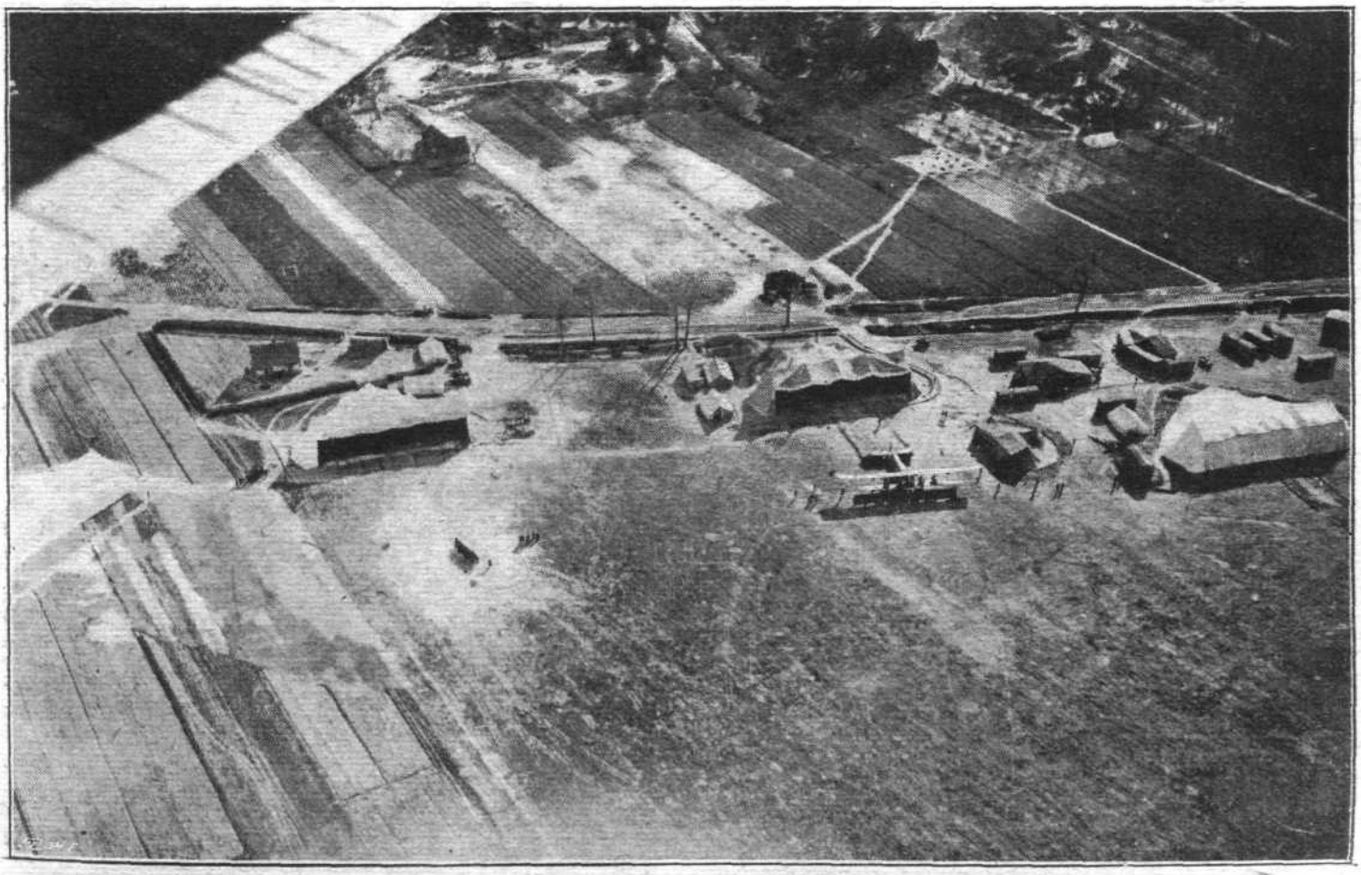
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The Nationalisation of Industry.

The more we regard the speeches of responsible Ministers and other lesser lights of the political world when they touch upon the future of industry after the war, the less we like the prospects. The whole trend of opinion seems to be towards the nationalisation of our staple industries, which is a most disquieting feature of the present political and governmental situation. Speaking at Glasgow the other day, Mr. G. N. Barnes, M.P., said in reply to questions that he was certainly not in favour of any repudiation of our war debt. If necessary, we should have to impose an additional tax on those best able to pay it—meaning, we take it, the unfortunate middle and professional classes. He would have nothing in the nature of repudiation or lessening of the rate of interest promised to those who had contributed to the war loans. So far, that is good, but he then—according to the reports—went on to say that he hoped the country would not allow national factories to revert to private owners. These factories should be retained by the nation and serve to lessen the national debt.

We should very much like to know what Mr. Barnes really meant by this. It is bad enough to visualise the entry of the State into trade at all, even if that entry were to be restricted to the activities of the factories which have been created by the Government directly to carry on war work, such enterprises as, for example, the Gretna munitions factories. But carried to the logical end of Mr. Barnes' pronouncement it means far more than that. He says he hopes the national factories will not be allowed to "revert" to (their former) private owners. Does he mean that, or did he make use of the word "revert" inadvertently or in a wrong connection? If he really meant what he said, then he, a responsible Minister of the Crown, pronounces in favour of a bold policy of open confiscation of private businesses, in the shape of the many hundreds of such enterprises which have passed under Government control for the period of the war and—if he and his fellows can have their way—for ever. Possibly confiscation may be too strong a term, but at least the meaning of the speech under discussion is that these enterprises will become the property of the State through enforced sale at a figure to be fixed by the State. True, Mr. Barnes may not have intended to include the "controlled" industries, and was only referring to the factories actually set up by the Government during the war, but that is not what he is reported to have said, nor do his utterances mean that. Perhaps he will be good enough to explain what he really did mean to convey.

In any case we simply have no patience with those who affect to see a way out of the financial burdens with which we shall be saddled as a consequence of the war through the medium of State trading.



AT THE RUSSIAN BASE AT PHISHGOUROFF.—Photograph taken from a Sikorsky machine.

According to them, we shall not feel the burden at all if only we will consent to let the State become the universal provider—and keep their jobs for them. It is at least probable that they see quite as clearly as anyone that for the State to become an active competitor in industry means the ruin of all private enterprises of a similar nature. The latter cannot exist in the face of the subsidised competition of the former. Moreover, the State-controlled product is notoriously far more expensive and is not half as good, generally speaking, as that produced by private enterprise in the face of active competition. It means, in a few words, that the public is forced directly to pay a high price for an inferior product, while indirectly it pays still more in taxation to make up the deficit which is the almost invariable accompaniment of State manufacture or trading.

There is another aspect of the question, which seems to be the very last to appeal to these political tub-thumpers who affect to regard the State ownership of industry as the panacea for all evils. They talk glibly of reducing the war burden through the vast profits to be made by visionary enterprises, but they forget that they cannot have it both ways. Do they propose to get *all* the money they require for loan services and current expenses of Government out of their shop-keeping, or do they still look to the patient tax-payer to find the greater or lesser proportion? Obviously, they cannot expect to get it all from trade, and they appear to forget or to ignore the fact that by the time they have killed off the most paying industries by their State-trading policy and have thereby set in motion a set of reactive forces the full consequences of which cannot be foreseen, they will have ruined the very class from which the major portion of the taxation of the country is forthcoming.

It seems to us that all these outpourings of the politicians in favour of the nationalisation of this industry and that, are born of the knowledge that the necessities of the war have created a Frankenstein bureaucracy which must be appeased unless it is, at the end of the war, to turn and destroy its creators. It is significant that it is only among the politicians that this talk of nationalisation is heard. So far as our observation carries us, not a single prominent man of business in the country has uttered a word except in the strongest terms of criticism of the idea. If it were such a splendid thing for the country, why is it that the best business brains of the State are not devoted to the furtherance of the idea? The answer is that the policy, if it can be dignified by the name, is utterly wrong and opposed to every interest concerned with industry and is to be summed up as an attempt to placate the unthinking elements among Labour on the one hand, and to provide jobs for the bureaucracy on the other.

HONOURS

Honours for Ostend Attack.

IN the despatch from Vice-Admiral Sir Roger J. B. Keyes, K.C.B., C.M.G., C.V.O., D.S.O., relative to the attack on Ostend on the night of May 9th/10th, 1918, it is stated that the co-operation of the Air Force under Brigadier-General Charles L. Lambe, C.M.G., D.S.O., R.A.F., was of great value during the operation. In spite of the fog, the squadron under the command of Squadron-Commander Herbert G. Brackley, D.S.O., D.S.C., continued to attack in accordance with programme until after the completion of the operation.

The following volunteered for dangerous rescue work :—
Air-Mech. 1st Cl. D. G. Smith, R.N.A.S., O.N. F. 12853.

The following rendered good service in attending wounded :
Leading Mech. W. H. Grice, R.N.A.S., O.N. F. 12790.
Air-Mech. 1st Cl. L. N. Senside, R.N.A.S., O.N. F. 13014.

The King has approved of the award of the Distinguished Service Medal to the following in recognition of distinguished services :—

Air-Mech. 1st Cl. D. G. Smith, R.N.A.S., O.N. F. 12853.

French Honours for R.N.A.S.

IT was announced in a Supplement to the *London Gazette* on August 28th that the following decorations have been conferred by the President of the French Republic for distinguished services rendered during the war :—

Legion of Honour—Officier.

Rear-Admiral G. C. Cayley, C.B. (Temp. Maj. Gen., R.A.F.).

Medaille Militaire.

Air-Mech. 1st Gr. R. G. Kimberley, D.S.M., R.N.A.S., O.N. F. 4766.

P.O. Mech. G. C. P. Rumming, C.G.M., R.N.A.S., O.N. F. 8130.

P.O. Mech. J. H. Russell, C.G.M., R.N.A.S., O.N. F. 839.

Mentioned for Work in Mesopotamia.

IN the despatch dated April 15th, 1918, from Lieut.-Gen. W. R. Marshall, K.C.B., K.C.S.I., Commanding-in-Chief Mesopotamian Expeditionary Force, the names of the following officers, non-commissioned officers and men of the Royal Air Force, serving or who have served under his command, are included in the list of those whose distinguished and gallant services and devotion to duty he considers deserving of special mention :—

Maj. R. A. Bradley (formerly N. Staff. R.); Capt. (T./Maj.) H. De Havilland, D.S.O. (formerly R.F.C., S.R.); Lieut. F. V. Devonshire (formerly Hrs.); Maj. J. L. Grinlinton, D.S.O. (formerly R.G.A.); Maj. H. D. Jensen, M.C. (formerly R.F.C.); Lieut. A. H. E. Lindop, M.C., I.A.R.O.; Lieut. (T./Capt.) G. Merton, M.C. (formerly R.F.C., S.R.); Capt. B. G. M. F. Nixon, Dogras; Capt. F. L. Robinson, M.C. (formerly R. Innns. Fus.); Lieut. R. B. B. Sievier (formerly R.F.A.); Capt. R. D. Simpson (formerly R.F.C.); Lieut. (T./Capt.) G. Somers-Clarke (formerly R.F.C., S.R.); Lieut. G. L. Stedman (formerly R.F.C.); Maj. (T./Lieut.-Col.) J. E. Tennant, M.C. (formerly S. Gds.); Lieut. J. W. W. Tregale, I.A.R.O.

78866 1st Cl. A.M. (A./Sergt.) S. B. Ayling; 78867 Corpl. G. Downs; 3983 Flt.-Sergt. P. W. Evans; 4115 Flt.-Sergt. H. W. French; 2206 Flt.-Sergt. J. Halstead; 32525 Sergt. W. T. James; 26059 Sergt. E. S. Linton; 28571 Flt.-Sergt. T. A. Rhaney; 13641 Flt.-Sergt. A. G. Rogers.

Medals for the R.A.F.

IT was announced in a supplement to the *London Gazette* of August 29th that the King has been pleased to approve of the following awards :—

Military Medal.

401789 2nd Cl. Air-Mech. F. R. Berry.

Meritorious Service Medal.

12142 Flight-Sergt. E. J. O'Shea, R.A.F.

Ae.C.F. Gold Medals.

THE Aero Club of France has awarded its gold medal to Capt. Bishop, R.A.F., on the occasion of his having brought down his 100th machine. This includes 52 machines destroyed and 48 sent down out of control.

The Club has also awarded its gold medal to Lieut. Albert Mezergues, who was taken prisoner, after bombing Frankfort, and escaped. He has taken part in 97 bombing expeditions, 65 reconnaissances, 39 patrol flights, and 11 artillery observations; he has also destroyed four enemy machines.

The Albert Medal.

IT is announced in Army Orders that officers, warrant officers, non-commissioned officers and men who have been awarded the Albert Medal are now entitled to add the letters A.M. after their names.

FLIGHT
AIRCRAFT ENGINEER

THE SOPWITH "CAMEL."

130 H.P. CLERGET MOTOR.

[The following illustrated description of the Sopwith "Camel" has been translated from a German contemporary.—ED.]

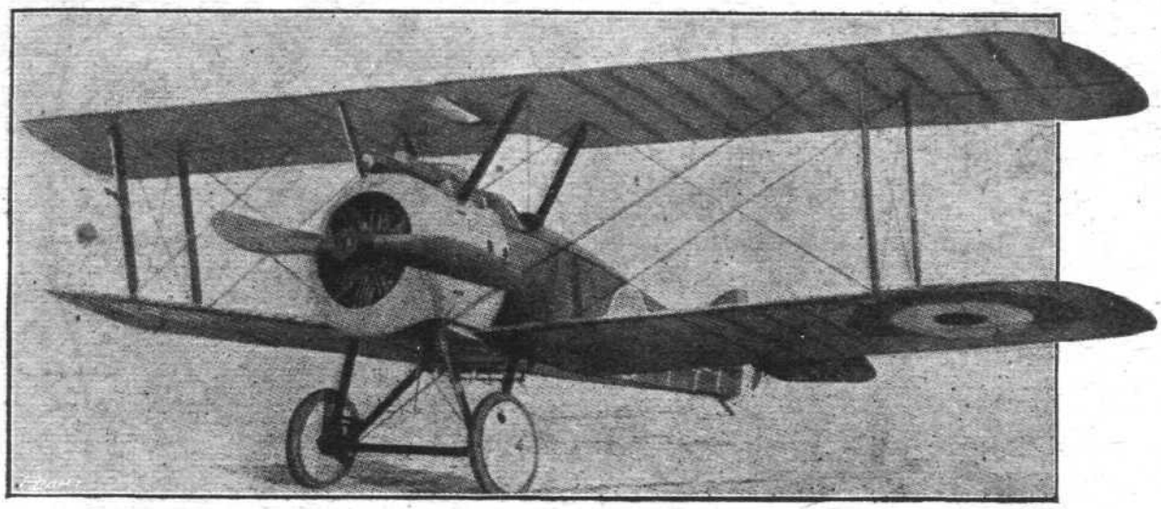
THIS machine, built by the Sopwith Aviation Co., Ltd., of Kingston-on-Thames, carries the designation F.1 B. 6290. It is a single-strutter machine and is a development of the Sopwith "Pup," from which, however, it differs in many details, apart from the greater power of its engine.

As in the older type the wings and tail plane with elevator are of trapezoidal plan form, but the greatest span occurs at the trailing edge. The top plane centre-section has a span of 2·17 m., while the strut attachments are only 1·48 m. apart. As the petrol pressure tank and gravity tank are placed rather far aft, the pilot's seat is placed immediately behind the motor, underneath the top plane centre-section. In order to provide a better view, a rectangular opening is cut in the centre section. The longitudinal edges of this opening are provided with three-ply plates projecting beyond the wing profile so as to reduce the amount of air flowing over the edges. To facilitate getting into and out of the machine the trailing edge of the centre-section has been cut away. Upper and lower planes have an equal span of 8·57 m., and an equal chord of 1·37 m. The aspect ratio is therefore 6·25 against the aspect ratio of 5·15 of the older type.

The wing spars, which are made of spruce, are spindled out to an I section, with the exception of the bottom rear spar, which is left solid. The gap between the planes is 1·31 m. at the tips and 1·52 m. near the body. (In the older single-seater the gaps were 1 m., and 0·86 m. respectively.) The upper plane is staggered forward 0·45 m. There is no sweep-back. The dihedral angle of the top plane is 178 deg. and of the bottom plane 170 deg. The angle of incidence of the top plane is 2 deg. at the centre-section, 3 deg. at the tip. The bottom plane has a uniform angle of incidence of 3 deg.

The inter-plane struts, which are of solid spruce of stream-line section, are, as in all Sopwith machines, placed with their ends in steel shoes welded to the fittings on the wing spars, and are provided with no further attachment. The lift wires and landing wires, of which the former are in duplicate, are in the form of stream-line wires.

Non-balanced *ailerons* are fitted to the rear spars of both planes. The wing fabric, which is sewn on to the ribs, is cream coloured underneath, and the top surface, as well as the body fabric, is painted a redish brown. The body, which is of the usual girder type with four *longerons*, has a rounded top. The undercarriage is of the usual Sopwith type. A divided aluminium axle rests in a stream-line covering of wood. The axle hinges are braced from the *fuselage*.

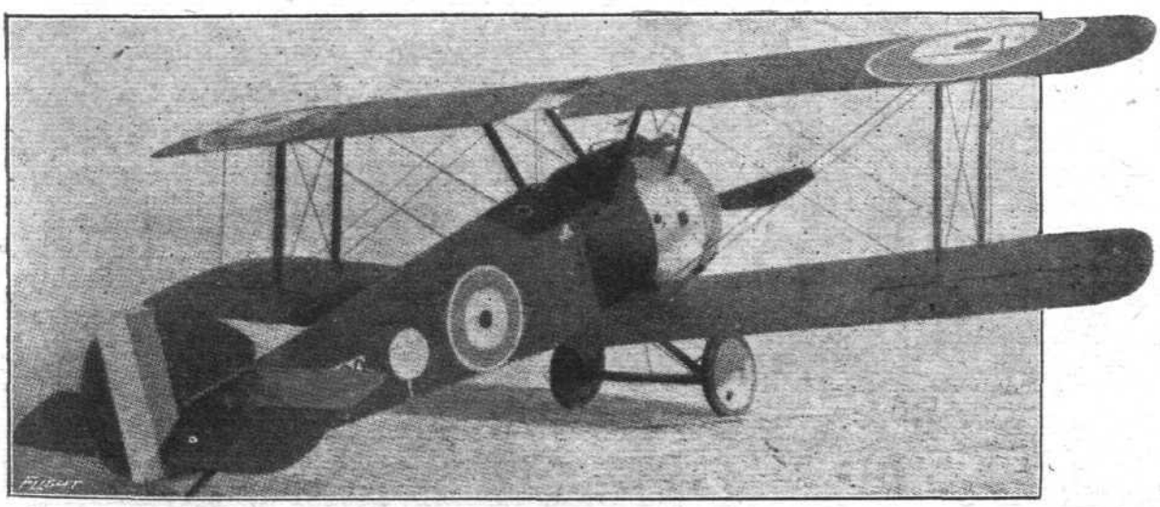


Three-quarter front view of the Sopwith "Camel."

The tail plane, which is deeply cambered on both sides, is rigidly attached to the upper body *longerons*, with an angle of incidence of 1·5 deg. The tail plane trimming gear hitherto fitted to all Sopwith machines has been abandoned, in spite of the fact that the petrol tanks are placed behind the pilot's seat. The fin and rudder are of the usual characteristic Sopwith form.

The 130 h.p. Clerget motor, which is built by Gwynnes, Ltd., develops about 134 h.p. at 1,200 r.p.m. According to a plate in the pilot's cockpit the revolutions of the engine are not to exceed 1,250 r.p.m.

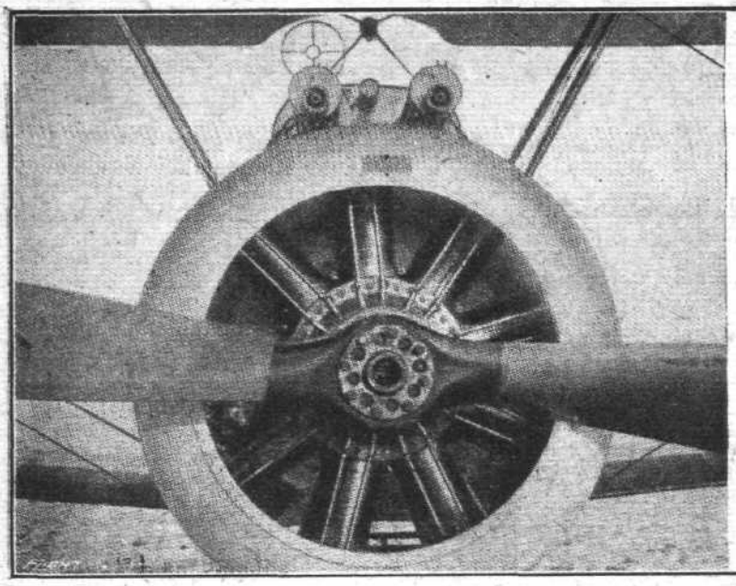
The petrol pressure tank has a capacity of 138 litres and the gravity tank holds 32 litres. This gives sufficient fuel for a flight of about 3½ hours' duration. An oil tank with a capacity of 30 litres is placed behind the engine. In some machines the tanks are of welded sheet aluminium, in others they are made of lead-coated, riveted sheet iron. The weight of the tanks is 12·5 kg. and 20 kg. respectively, giving a percentage weight of $\frac{12{\cdot}5}{146} = 0{\cdot}0832$ and $\frac{20}{146} = 0{\cdot}133$ respectively.



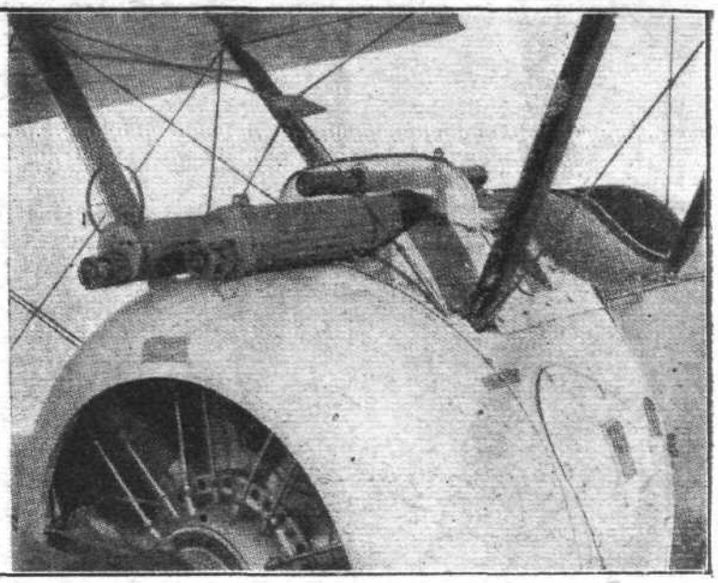
Three-quarter rear view of the Sopwith "Camel."

In the pilot's cockpit are the following instruments, &c. :—

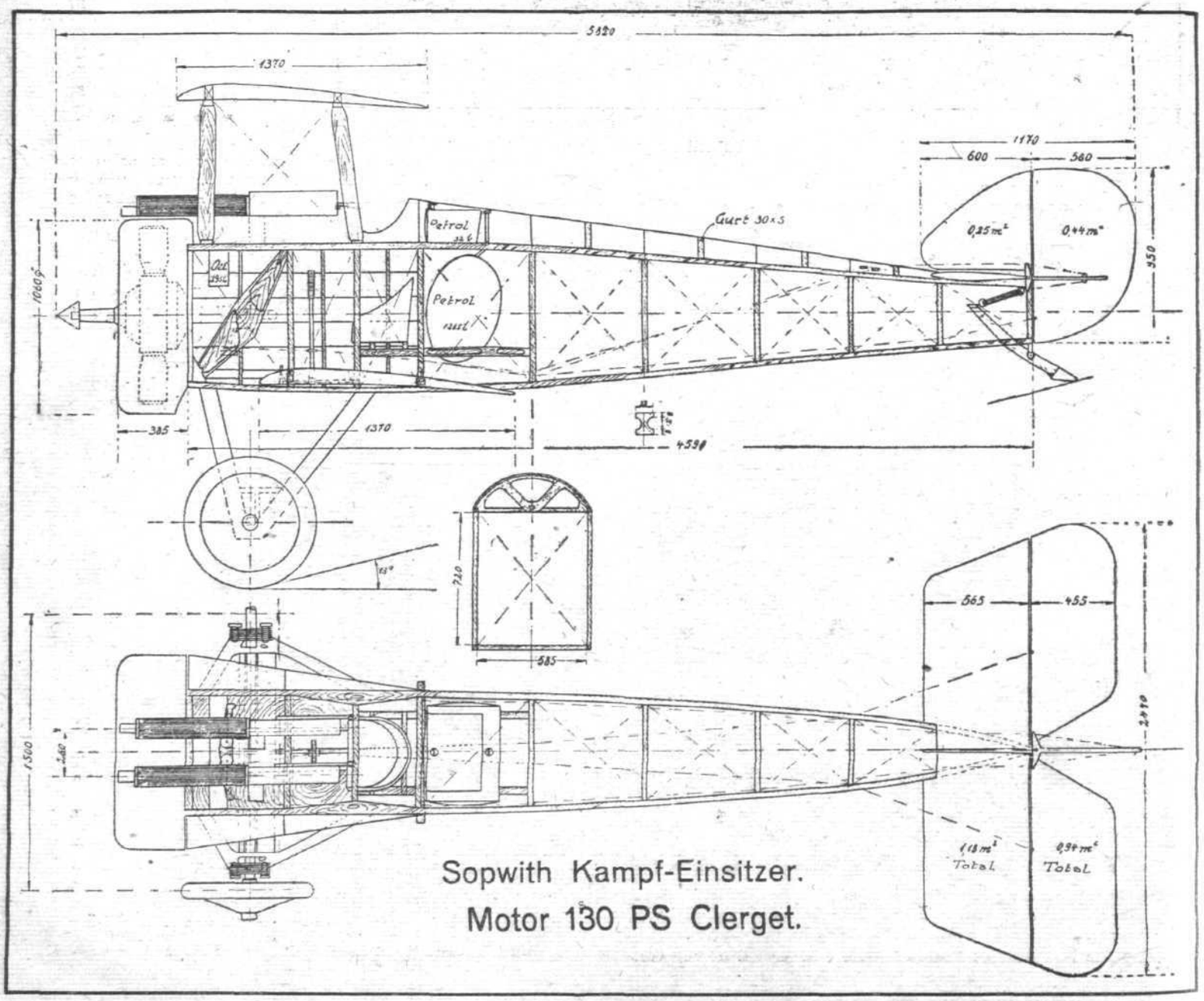
In the centre on the instrument board : Manometer, with safety valve, clock, pressure gauge, altimeter, compass, two switches, revolutions indicator, and pulsometer. On the right : The hand-pump (air). On the left : Control levers for



The 130 h.p. Clerget motor of the Sopwith "Camel," seen from the front.



The arrangement of the machine guns and telescopic sight on the Sopwith "Camel."



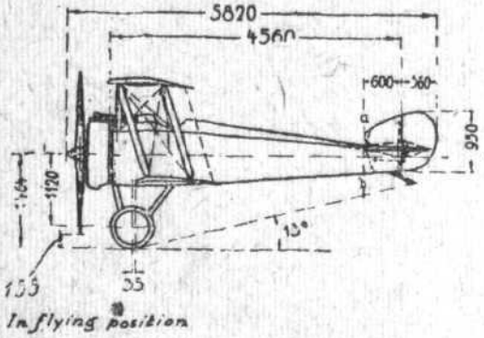
Side elevation and plan of the *fuselage* of the Sopwith "Camel."

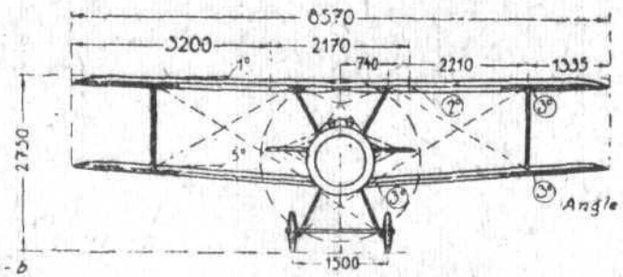
Sopwith-Kampf-Einsitzer 130 P.S. Clerget.

"Sopwith camel"

Manufacturer: The Sopwith Aviation Comp

Kingston on Thames







Max Cross-Section at Engine Cowl

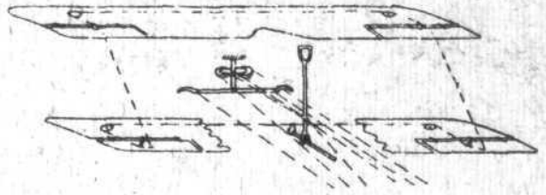


Area: 0·88 m²

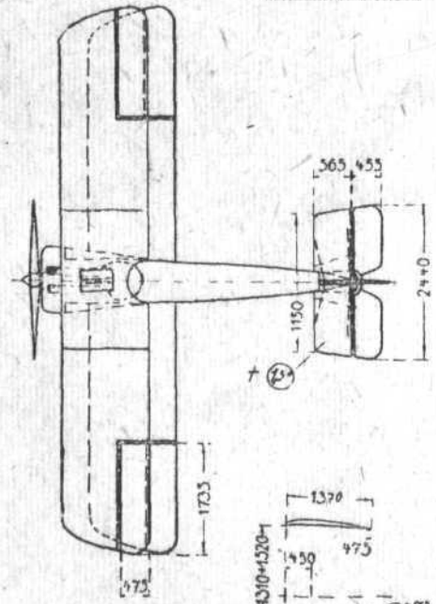
Body: Girder Type.

Stern Post: Height: 350 m/m. Width: 25 m/m.	Longerons: Ash Struts: SPRUCE Bracing: WIRE Covering: FABRIC

Diagram of Controls

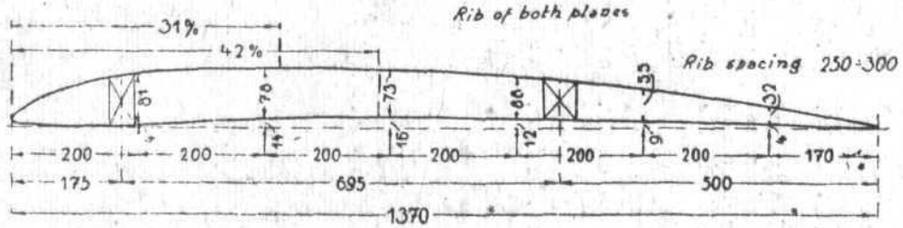


0 2500 mm

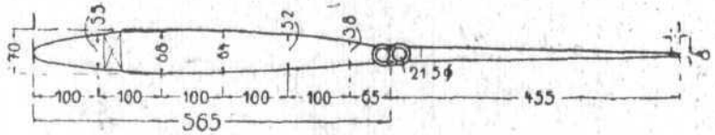


Rib of both planes

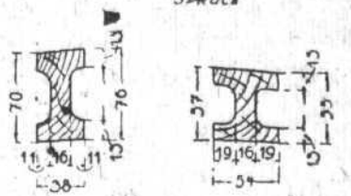
Rib spacing 250-300



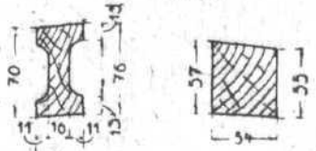
Tail plane and Elevator



Section of Upper Spars SPRUCE



Section of Lower Spars SPRUCE



WING AREA m²	MOTOR	AIRSCREW	UNDERCARRIAGE:	
Top: 1060. Bot: 916 + 1976 Ailerons: 4 × 81 = 3·24 Tail pl.: 1·18, Elev.: 1·94 Rudder: 0·44 Fin: 0·25	130 HP Clerget Brake Horse Power N = 134 HP n = 1205 r.p.m.	Wood, 2 blades Dia: 259 cm. Blade width 27 cm. Pitch 278 cm. n = 1205 r.p.m.	Struts: Steel tube without filling.	Shock absorb.: Rubber Travel: 150 m/m. Hub length: 160 m/m. Internal Dia: 32 m/m.

General arrangement, and some details, of the Sopwith "Camel."

pressure and gravity petrol tanks, petrol tap, throttle lever, petrol level indicator for pressure tank, Bowden cable for bomb release. A propeller air pump for the pressure tank is mounted on the starboard chassis strut. Two fixed Vickers guns are mounted on top of the *fuselage*. Their locks and feed block levers are inside the body covering. Between them is a telescopic sight. In a bomb rack under the body can be carried four bombs, the Bowden controls for which are placed to the left of the pilot. There is no bomb sight fitted.

The weight of the machine empty was ascertained to be 430 kg. With tanks full the weight of the fuel is 150 kg. With pilot and armament the useful load would then amount to 290 kg. It is therefore to be assumed that the weight of about 50 kg. of bombs is only carried when the tanks are not full. Assuming a useful load of 290 kg. the total weight "all up" amounts to 720 kg. As the wing area is 19·76 m², the loading is 36·5 kg. per sq. m., and the loading per h.p. is 720 ; 134 = 5·37 lbs./h.p. The corresponding loadings for the Sopwith "Pup" were 23·4 and 6·6 respectively. The "Camel" has therefore a higher wing loading, but a considerably smaller loading per h.p.

Detail weights :—Motor, 159·0 kg. ; airscrew, 18·0 kg. ; tanks, 12·5 k.g. ; motor accessories, 12·5 kg. ; body with aluminium covering, &c., 48·5 kg. ; Seat, &c., 9·0 kg. ; undercarriage, 39·0 k.g. ; tail skid, 2·5 kg. ; controls, 4·5 kg. ; wings, 100·0 kg. ; tail plane, fin, rudder and elevator, 13·0, kg. ; fittings for armament, 11·5 kg. ; total, 430 kg.

Weight of wings.—5·5 kg./sq. m.

Loading.—Pilot, 80 kg. ; armament, 60 kg. ; 4 bombs 50 kg. ; instruments, 5 kg. ; fuel, 150 kg. ; total, 290 kg.

Lieut.-Col. Bishop, V.C., D.S.O., M.C., D.F.C.

IN the *London Gazette* of September 6th it was announced that Capt. (Temp. Maj.) W. A. Bishop, V.C., D.S.O., M.C., D.F.C. (Capt., Can. Light Horse) relinquished his commission in the R.A.F. on August 5th on ceasing to be employed. In a War Office supplement to the same Gazette it was announced that Capt. (Actg. Maj.) W. A. Bishop ceased to be seconded for duty with R.A.F., and was appointed Temp. Lieut.-Col. in the Canadian Cavalry, dated August 5th.

It has since been announced in the *London Gazette* that Lieut.-Col. Bishop is appointed General Staff Officer, 1st grade. He will be attached to the Canadian Headquarters in London for the purpose of organising and training the newly authorized Canadian Air Force.

Air Ministry Staff Enquiry.

THE Secretary of State for the R.A.F. has appointed a Departmental Committee, under the chairmanship of Mr. Cosmo Bonsor, to carry out a detailed enquiry into the establishments of the Air Ministry in order to establish how far the staff is adequate or otherwise for the work to be done, and with particular reference to the question of the possible release of officers of high medical category for service in the field.

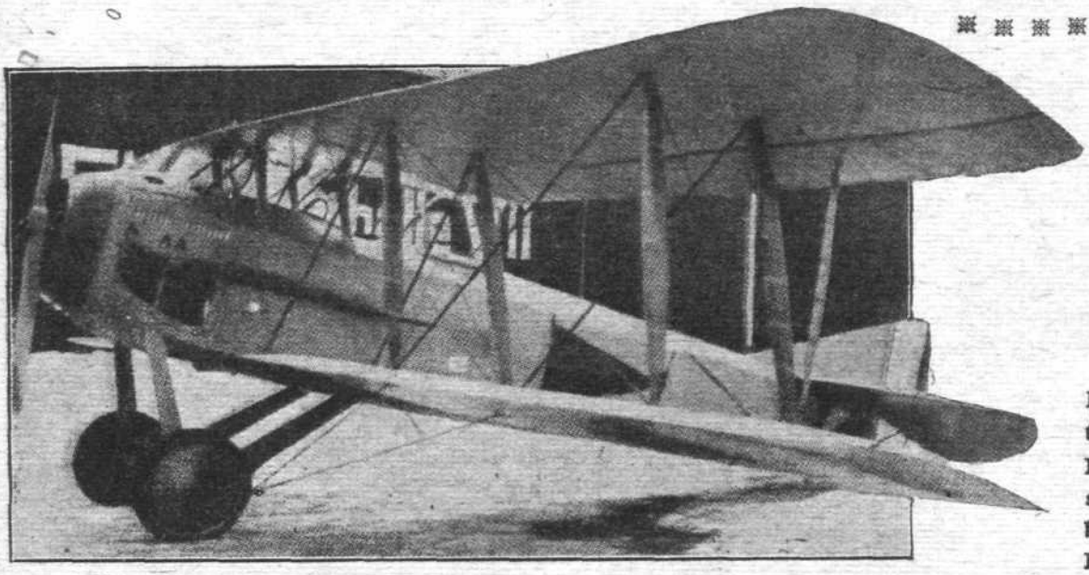
New Commandant of the W.R.A.F.

MRS. GWYNNE-VAUGHAN, C.B.E., D.Sc., Chief Controller of Queen Mary's Army Auxiliary Corps, Overseas, has been appointed Commandant of the Women's Royal Air Force in succession to the Hon. Violet Douglas-Pennant.

Relations between the Army and the R.A.F.

IT is announced in Army Orders that the following addition has been made to the Regulations dated June 12th, 1918, made by the Army Council and Air Council :—

"Every airman of the Regular Air Force who may for the time being be on board any vessel employed as a military transport or troopship shall be temporarily attached to the Regular Forces while on board, and during such time only as there may not be on board the same vessel an officer of the Regular Air Force or a naval or military officer attached to the Regular Air Force (other than an officer holding only an honorary commission)."





In the Hands of the Enemy.—A British Spad two-seater captured by the Germans. Reproduced from *Flugsport*. Below, a three-quarter rear view.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

THE FLYING SERVICES FUND

(Registered under the War Charities Act, 1916).

Honorary Treasurer:
The Right Hon. LORD KINNAIRD.

Committee:
Brig.-Gen. W. W. WARNER, R.A.F. (*Chairman*).
Mr. CHESTER FOX.
Lieut.-Col. HARCOURT G. GOLD, R.A.F.
Lieut.-Col. T. O'B. HUBBARD, M.C., R.A.F.
Lieut.-Col. C. E. MAUDE, R.A.F.

Secretary:
Lieut.-Com. H. E. PERRIN, R.N.V.R.

Bankers:
Messrs. BARCLAY'S BANK, LTD., 4, Pall Mall East, London, S.W. 1.

Objects:

The Lords Commissioners of the Admiralty and the Army Council having signified their approval, THE ROYAL AERO CLUB has instituted and is administering this Fund for the benefit of Officers, Non-Commissioned Officers and Men of the Royal Air Forces who are incapacitated on active service, and for the widows and dependants of those who are killed.

Subscriptions.

The following contributions have been received this year :

	£	s.	d.
Staff and Workers of Gwynnes, Ltd.	158	2	10
A. M. Ramsay	1	0	0
Rev. H. Dalzell	5	5	0
Aircraft Supplies, Ltd.	7	7	4
Aerodrome Sports Committee, Sir W. G. Armstrong Whitworth & Co., Ltd.	46	16	0
D. Davies	1	1	0
A. H. Ruddick	30	0	0
A. O. L. Longridge	1	0	0
Standard Aircraft Co.	26	5	0
C. A. Best	3	3	0
E. L. Gandar-Dower	3	11	0
The Prodger-Isaac Aviation Co.	2	6	3
E. W. Phillips, per Capt. Beddard	2	0	0
Miss E. Bairdsmith	1	1	0
W. R. D. Shaw	0	10	6
The Marine and General Aviation Co.	0	10	6
Officers, N.C.Os. and Men, Repair Park, 2 Aero S.D., Royal Air Force, B.E.F. (1,000 francs) ..	36	19	3
Jury, Witnesses and Medical Officer on inquest on J. L. Smith	1	10	0
Canteen and Entertainments Committee, Royal Air Force, Fort Tregantle	50	0	0
Proceeds of Concert given by the R.A.F., Eastleigh Stores, at Southampton on May 24th, 1918 ..	126	15	4
Dunford and Elliott (Sheffield), Ltd.	10	0	0
Isaac J. Burgess	2	2	0
"A" Section, School of Technical Training, R.A.F., Halton Camp East, Bucks.	6	0	0

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W.1,
H. E. PERRIN, Secretary.

THE ROLL OF HONOUR

(When an Officer is seconded from the Army, his unit is shown in brackets.)

Published September 4th.

Killed.

Guthrie, Sec. Lieut. A. C. (R.E.).
Ridout, Sec. Lieut. A. G.
Ross, Sec. Lieut. J. S.
Shepherd, Sec. Lieut. J. A.
Stone, Lieut. R.
Walker, Lieut. J. P.
West, Lieut. P. C.

Died of Wounds.

Ferguson, Sec. Lieut. D. A. (Aus. F.C.).

Drowned.

Saville, Lieut. A. E.

Wounded.

Anthony, Capt. M. S. (North'd F.).
Baker, Lieut. G. H.
Barlow, Sec. Lieut. F. C.
Black, Lieut. J. R.
Hamley, Lieut. N. H.
Hervey, Sec. Lieut. V. H.
Hughes, Sec. Lieut. H. R.
Llewelyn, Lieut. T. F. P.
Mercer, Sec. Lieut. W. A.
Miller, Sec. Lieut. C. H.
Pendleton, Sec. Lieut. W.
Ritch, Lieut. J. W.
Roberts, Lieut. A. C. (Midd'x.).
Robertson, Sec. Lieut. J. R.
Smallwood, Lieut. R. G. (Aus. F.C.).
Smithyes, Lieut. E. S.
Walpole, Sec. Lieut. H. N. (Sher. F.) (T.F.).
Yates, Lieut. S.
Young, Sec. Lieut. J. McK.

Missing.

Andrews, Sec. Lieut. J. G
Churchill, Sec. Lieut. J.
Crouch, Sec. Lieut. J. E.
Culver, Sec. Lieut. D. E
Darlington, Lieut. C. D.
Denny, Lieut. C. H.
Drabble, Lieut. C. F.
Fattorini, Lieut. T.
Gould, Capt. H. R., M.C.
Howard, Sec. Lieut. G. R.
Jinman, Lieut. E. W. F.
O'Shea, Lieut. H. A.
Parkes, Sec. Lieut. S. J.
Rawley, Sec. Lieut. R. W.
Sangster, Sec. Lieut. A. B.
Stedman, Sec. Lieut. A. R.

Published September 5th.

Killed.

MacDonald, Lieut. R. C. (R.F.A. (S.R.)).
Mossop, Lieut. C. S.
Paxton, Sec. Lieut. G. A. (R. Suss.).
Renton, Sec. Lieut. E. G.
Shepherd, Sec. Lieut. O. D.
Stewart, Sec. Lieut. E. R.
Weir, Sec. Lieut. C. G.
Winter, Sec. Lieut. R. R. C. (Durh. L.I.).

Previously Missing, now reported Killed.

Money, Sec. Lieut. D. G. (R.F.C.).

Cadets Killed.

Barber, W. F.
Corbett, W. L.
Denny, F. G.
Gillies, W.
Ling, W. F. E.
Mackay, J. W.
Tracey, E. O.
Tyson, T. M.

Wounded.

Baxter, Sec. Lieut. A. J. (Linc.).
Gordon, Sec. Lieut. E. C.
Keen, Maj. A. W., M.C.
Kesterton, Sec. Lieut. L. G.
Kinney, Lieut. M. C.
Lees-Smith, Maj. H. S.
Markham, Lieut. W. H. (Manch.).
Pelham, Sec. Lieut. W. C.
Ramage, Sec. Lieut. L. W. (Glouc.).
Rowsell, Sec. Lieut. L. F.
Robb, Capt. J. M. (North'd. F.).
Shearing, Sec. Lieut. E. A.
Whiteman, Sec. Lieut. A. K.

Missing.

Arthur, Lieut. T. J.
Cotton, Sec. Lieut. E.
Hill, Sec. Lieut. G. A. R.
Hills, Sec. Lieut. J.
Johnson, Lieut. C. S.
Kilbourne, Lieut. W. H.
Lawe, Lieut. A. G. (Dorset).
Partridge, Lieut. A. T.
MacDonald, Lieut. K. M. (North'd. F.).
Payton, Lieut. J. L. (R.F.A.).
Pollard, Lieut. W. H.
Smith, Lieut. D. E.
Stepphens, Sec. Lieut. D. E.
Thorpe, Sec. Lieut. C. E.

Published September 6th.

Killed.

Dickson, Sec. Lieut. J. H.
Hall, Lieut. J. F. A. (E. Yorks.).
Millar, Sec. Lieut. A. F.
Savage, Lieut. H. W.
Smith, Sec. Lieut. G.
Wald, Lieut. A.

Died of Wounds.

Hopton, Sec. Lieut. H. W.
West. Sec. Lieut. S. J.

Cadets Killed.

Barton, H. W.
Buckley, H.
Godwin, A. W. W.
Harrison, A. M.
Macilroy, T. S.
Nord, H. A.
Smith, J. L.
Smith, W. K.
Wicherley, G.

Wounded.

Atkinson, Sec. Lieut. H.
Brock, Lieut. C. G.
Buist, Lieut. A. C. S. (Gord. Highrs.).
Curtis, Lieut. L. R.
Frederichsen, Sec. Lieut. P.
Gibson, Lieut. A. R.
Hartford, Sec. Lieut. T.
Isaac, Lieut. K. J.
Jackson, Lieut. R. W., R.F.A. (S.R.).
Longbottom, Lieut. H. F.
Muirhead, Lieut. C. F.
O'Meara, Sec. Lieut. B. J.
O'Sullivan, Lieut. G. R.
Shirley, Sec. Lieut. A. E.
Tyreman, Lieut. C. H.
Williams, Sec. Lieut. P. J.
Williams, Sec. Lieut. R. L.

Missing.

Davies, Sec. Lieut. J. H.
Davis, Lieut. R. H.
Dunlop, Sec. Lieut. J. M.
Hazen, Lieut. T. D.
Ingram, Capt. R. S. S.
Johnstone, Lieut. J. R.
Latimer, Capt. D. M. C.
Meyer, Sec. Lieut. O. F.
Noel, Lieut. T. C., M.C. (K.O. Sco. Bord.).
Roberts, Lieut. C. H.
Schorn, Sec. Lieut. F. F.
Venter, Capt. C. J.
Woodend, Sec. Lieut. C. W.

Published September 7th.

Killed.

Agnew, Lieut. J.
Cave, Sec. Lieut. J. E.
David, Lieut. J. E.
Royle, Capt. L. V. A.
Shuttleworth, Sec. Lieut. R. W. (Lan. Fus.).
Somerville, Sec. Lieut. P. T.
Wilson, Lieut. H. E.

Died of Wounds.

Calvert, Sec. Lieut. E.

Previously Missing, now reported by German Government Killed or Died of Wounds.

Doidge, Lieut. E. L. (Manit.).

Cadets Killed.

Beet, G. W. A.
Brown, C. E.
Brown, C. D.
Carradine, W. G.
Fisher, O.
Graham, V. W.
Harris, A. G.
Mathie, T.

Wounded.

Beck, Lieut. J. G.
Carson, Lieut. W. F.
Cutler, P.F.O., R. O.
Hubbard, Lieut. W.
Hyslop, Sec. Lieut. J. B.
Marrow, Capt. E. T.
Mawdesley, Lieut. F. J. (Cent. Ont.).
Phear, Lieut. H. W.
Shaw, Sec. Lieut. G. L.
Solomon, Lieut S. A. R.
Tarbolton, Lieut. J. S.

Missing.

Alexander, Sec. Lieut. T. M.
Claxton, Lieut. W. G.
Curtis, Sec. Lieut. H. C.
Dove, Lieut. W. H. (Sask.).
Drinkwater, Lieut. E. O.
Duthie, Sec. Lieut. D. O.
Glasse, Lieut. E. S.
Hales, Capt. J. P.
Locke, Sec. Lieut. E. G.
McCallum, Lieut. J. R. R. G.
Porter, Sec. Lieut. A. C.
Scott, Sec. Lieut. H.
Tupman, Sec. Lieut. A. L. (Sher. For.).

Published September 9th.

Killed.

Bell, Sec. Lieut. C. C. M.
Cavanagh, Sec. Lieut. J. C.
Fitton, Sec. Lieut. W., M.M. (Lan. F.).
Maker, Sec. Lieut. W. F.
McLean, Sec. Lieut. C.
Robinson, Sec. Lieut. F. C.
Rowe, Sec. Lieut. M. E.
Bertram-Scott, Sec. Lieut. G.

Cadets Killed.

Fesser, C. F.
Garden, D.
Haskew, C. C.
Jennings, R.
Simpson, J.
Wallace, G. R.
White, E. A.
Whitley, T. T.

Wounded.

Davies, Capt. F. J.
Fraser, Lieut. C. N.
Garne, Sec. Lieut. S. H. J.
Gibson, Lieut. F. E.
Orris, Sec. Lieut. F. R.
Stupart, Lieut. A. V.
White, Lieut. C. C.

Missing.

Andrews, Lieut. J. S.
Belliveau, Lieut. A. H. (Can. For.).
Brie, Lieut. R. A. C.
Burnham, Lieut. M. E.
David, Sec. Lieut. C. K.
Hitchcock, Sec. Lieut. C. G.
Home-Hay, Capt. J. B., M.C., D.F.C. (A. and S. Highrs.).
Leed, Sec. Lieut. D.
McIntyre, Lieut. L. H.
Mackay, Capt. E. A., M.C., D.F.C.
Mullen, Lieut. A. G. L.
Pickard, Sec. Lieut. C. G.
Smith, Lieut. G. H. B.
Valentine, Lieut. J.

Published September 10th.

Killed.

Bravery, Lieut. F. J.
Buckland, Sec. Lieut. C. J. (R. Fus.).
Campbell, Lieut. N. C. S.
Heath, Lieut. G.
Macbeth, Lieut. R. E.
Packer, Sec. Lieut. J.
Pertus, Lieut. R. A. (Can. For. C.).
Phillips, Capt. T.
Westmoreland, Sec. Lieut. E. H.
Wolstenholme, Lieut. J. B.

Previously Missing, now reported Killed.

Martin, Lieut. C. H. (Aus. F.C.).

Cadets Killed.

Finney, G.
Gardner, F. A.
Gibbs, D.
McGibbon, J.
Milward, J.
Oughtebridge, R.
Rawlings, C. J. H.
Watson, P. F.

Wounded.

Bishop, Sec. Lieut. N. F.
Calrow, Lieut. R.
Duthie, Sec. Lieut. G. A.
Finney, Lieut. J. L.
Jeffries, Capt. T. G.
Maclean, Sec. Lieut. W. J.
Marshall, Sec. Lieut. F.
Prentice, Sec. Lieut. G. A. F.
Howard, Sec. Lieut. S. (Aus. A.C.).
Stayner, Lieut. C. St. C. (New Bruns.)

Missing.

Collier, Sec. Lieut. D. C.
Glazebrook, Lieut. R. F.
Gilmour, Capt. S. G.
Gwyer, Sec. Lieut. N. E.
Hilton, Sec. Lieut. T. R.
McCarthy, Sec. Lieut. T.
Rees, Sec. Lieut. F. E.
Somerville, Sec. Lieut. C. W.
Stott, Sec. Lieut. J.
Taylor, Sec. Lieut. L. G.
Taylor, Sec. Lieut. E.
Trimble, Sec. Lieut. A. V.

Accidentally Killed.

Grove, Sec. Lieut. R. H. (Aus. F.C.).

Areas of R.A.F. in the United Kingdom.

IT is notified in Army Orders that for R.A.F. purposes the United Kingdom is divided into areas as follows :—

Area.	*Headquarters.*	*Counties comprising the area.*
North-Western area.	Adelphi Hotel, Glasgow.	All counties in Scotland.
North-Eastern area.	Racecourse Buildings, York.	Westmorland, Cumberland, Northumberland, Durham, Yorkshire, and those portions of Nottinghamshire and Lincolnshire north of the line Worksop—Lincoln (exclusive)—Horncastle—Ingoldmells.
Midland area.	Somerset House, Leamington.	Nottinghamshire and Lincolnshire (except as above) Leicestershire, Rutland, Northamptonshire, Huntingdonshire, Bedfordshire, Cambridgeshire, Norfolk, Suffolk, Lancashire, Cheshire, Derbyshire, Staffordshire, Warwickshire, Worcestershire, Shropshire, Herefordshire, and the counties of Wales with the exception of Glamorganshire.
South-Western area.	Chafyn Grove, Salisbury.	Glamorganshire, Monmouthshire, Gloucestershire, Wiltshire, Hampshire, Dorsetshire, Somerset, Devonshire, Cornwall, and Scilly Isles.
South-Eastern area.	Covent Garden Hotel, London, W.C. 2.	Essex, Hertfordshire, Middlesex, London, Kent, Surrey, Sussex, Berkshire, Oxfordshire and Buckinghamshire.
Ireland (Group).	9, Merrion Square, Dublin.	All counties in Ireland.

Each area is commanded by a General Officer of the R.A.F., who is responsible for everything in connection with the R.A.F. within his area.

Army Officers and Flying in R.A.F. Machines.

IT is also notified in Army Orders that if an Army officer wishes to visit any R.A.F. unit he should make application through the usual channels to the General Officer Commanding the area concerned.

Army officers, non-commissioned officers and men are forbidden to take passenger flights in aircraft belonging to the R.A.F., except on duty, and with the written consent of their Commanding Officer, stating the nature of the duty to be performed.

Trials of Soldiers' Inventions.

IT is notified in Army Orders that, in order that all facilities may be given officers and soldiers to develop ideas for the improvement of service equipment, the Field-Marshal Commanding-in-Chief, British Armies in France, and General Officers Commanding-in-Chief other Expeditionary Forces, may issue routine orders authorising trials of inventions submitted.

Seaplane Attack in Finland.

ACCORDING to official information received in Stockholm, three seaplanes participated in an attack on Kuelajaervi on August 25th, and the Finnish Government has ordered its Legation at Stockholm to lodge a protest with the Entente Legations. Six bombs are said to have been dropped and machine guns fired at German and Finnish troops. The machine is said to have been painted grey with large black rings under the planes. The Helsingfors newspapers say that it is incredible that British craft took part in the attack, but the Government should take steps to clear the matter up.

Record Aerial Mail Run.

WHAT is declared to be the longest air mail-carrying trip on the American Continent was completed on September 4th, when a pilot covered 540 miles, from Toronto to Ottawa and back, in 11 hours.

The Canadian Postmaster-General says that the recent aerial mail service experiments between Toronto and Ottawa have demonstrated the practicability of such a service.

The New French Bombing Planes.

THE *Petit Parisien*, discussing the work of the Allied Air Services, says the Germans have just recently made the acquaintance of our new bombarding planes, to the construction of which a great deal of attention has been paid during the past few months. This aeroplane shows an extremely appreciable improvement on any earlier machine used by the enemy, or indeed on any other type.

How the Australians Bagged an 11-in. Gun.

MR. BEAN, correspondent with the Australians, describing how a German 11-in. railway gun was captured on August 8th, says that Queensland infantry saw a train apparently trying to get off one line on to another to escape. In the centre of the train was a great sheeted object. A British plane dropped a bomb near the engine, which apparently damaged it, for a great steam cloud went up, and the crew, who were afterwards captured, were terribly scalded. The plane then dropped a bomb on the tail of the train, which blew up. An Australian engineer got up steam, unhooked the tail of the train, and shunted the gun through No Man's Land on to a rail leading into our lines.

FLIGHT
AIRCRAFT ENGINEER

TWO-SEATER RUMPLER BIPLANE, G. 117.

(260 H.P. MERCEDES ENGINE.)

Report by the Technical Department, Aircraft Production, Ministry of Munitions.

THIS machine, which was used by the enemy at the commencement of the year, is of the CV type, but differs only in detail from the earlier CIV type.

The general shape and disposition of the wings is maintained, including the characteristic sweep-back of the main planes, and the fitting of *ailerons* to the upper planes only. Some important particulars follow :—

Weight empty (but with water), 2,439 lbs. ; weight, fully loaded, 3,439 lbs. ; total military load, 545 lbs. ; area of upper wings (with *ailerons*), 217·6 sq. ft. ; area of lower wings, 146 sq. ft. ; total area of main planes, 363·6 sq. ft. ; loading per sq. ft. of wing surface, 9·5 lbs. ; area of tail plane, 22 sq. ft. ; area of fin, 4 sq. ft. ; area of elevators, 20·8 sq. ft. ; area of rudder, 6 sq. ft. ; total weight per horse-power, 13·2 lbs. ; petrol capacity, 59 gallons ; oil capacity, 3 gallons ; water capacity, 10 gallons ; endurance, about 4 hours.

Performance.

	ft.	m.p.h.	revs.
Speed at ..	.. 10,000	100.5	1,510
Speed at ..	.. 15,000	87	1,390

	ft.	m. s.	Rate of climb in ft. per min.	revs.
Climb to ..	10,000	16 0	400	1,375
Climb to ..	15,000			

Service ceiling, 15,500 ft. (estimated).
Estimated absolute ceiling, 17,500 ft.
Greatest height reached, 15,300 ft. in 38 min. 25 secs.
Rate of climb at this height is 125 ft. per min.

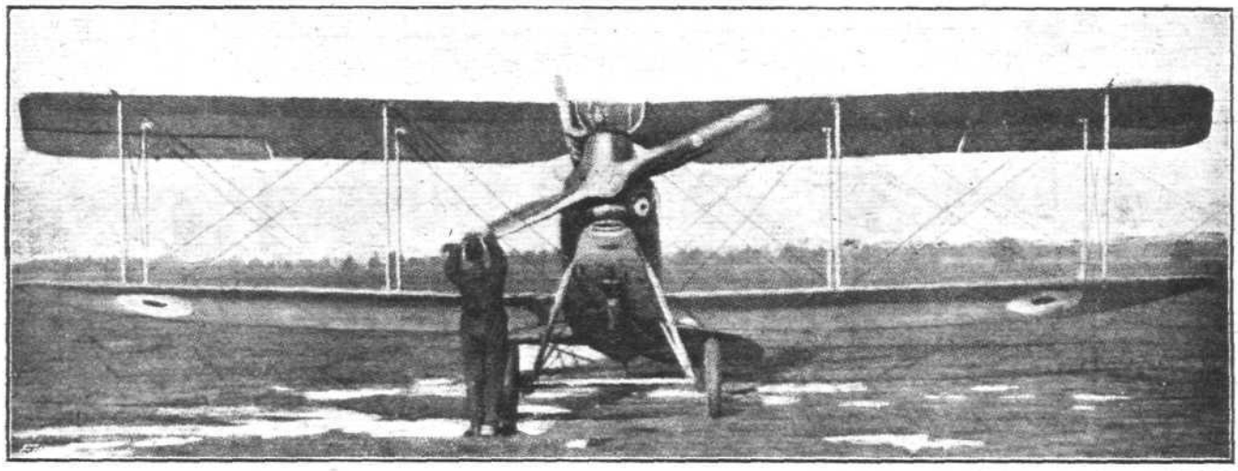
Control.

Longitudinal (elevators), good.
Lateral (*ailerons*), very heavy and very ineffective.
Directional (rudder), moderately light and quite effective.

It is reported that the machine is tiring to fly owing to the very poor lateral control ; that it is nose-heavy, and rather liable to get into a spin.

Wings.

The upper wings have a maximum span of 41 ft. 6 ins. and a chord of 5 ft. 8 ins. The span of the lower wings is 40 ft., and the chord is 4 ft. 4 ins.

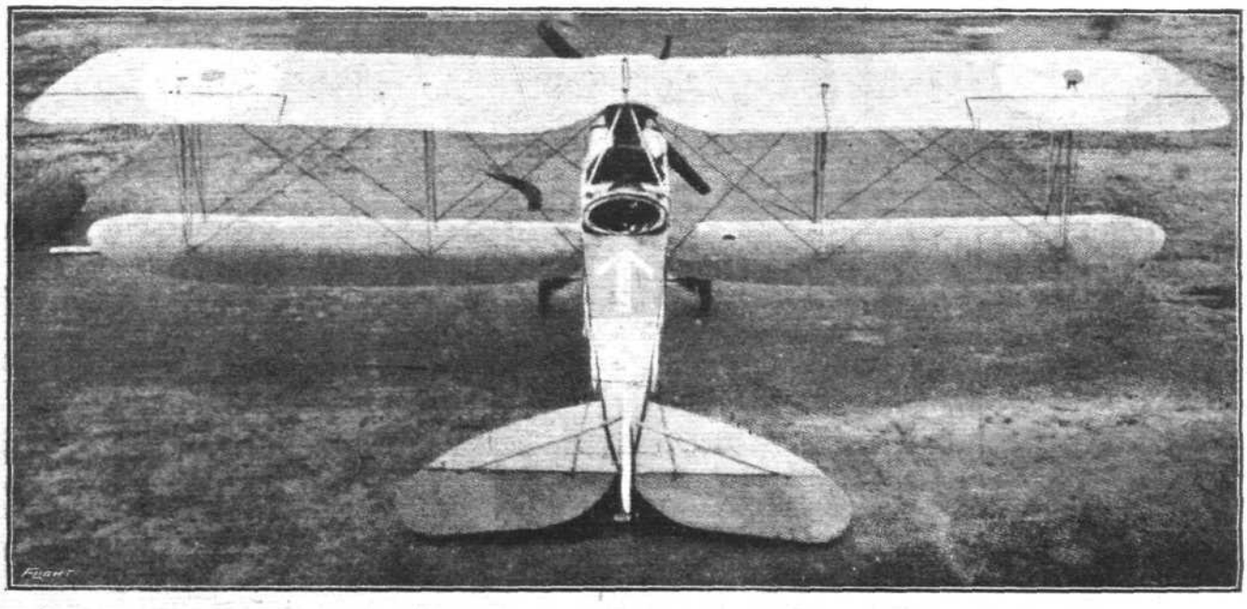


Front view of the 2-Seater Rumpler.

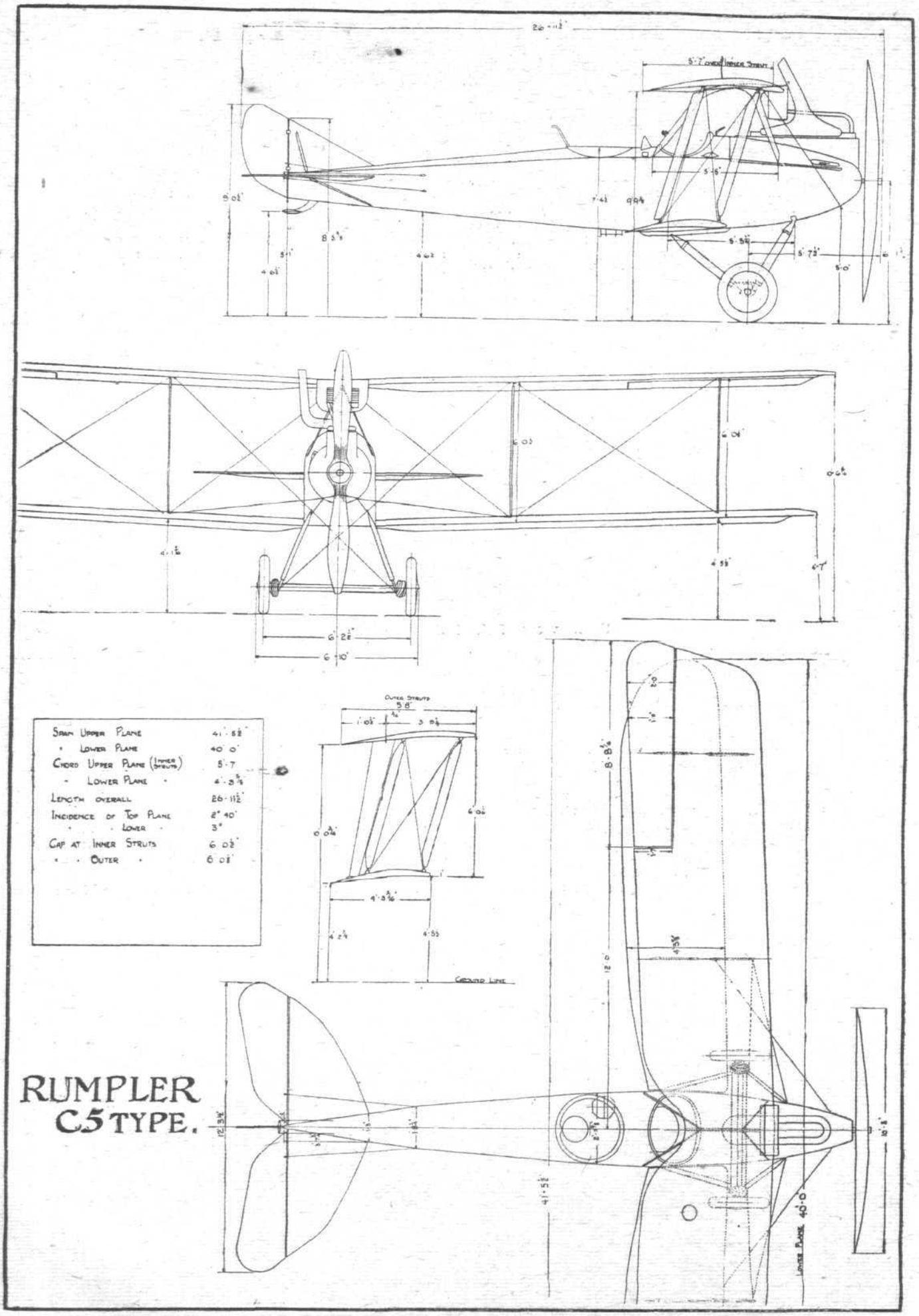
The wings are swept back through an angle of 3 degrees, and are set at 2½ degrees dihedral angle. The wing sections of upper and lower planes are given in Fig. 1. Both front and rear spars are of spruce, and are constructed in two halves, which are grooved and tongued, and then glued together. This is clearly indicated in Fig. 2. The ribs are built up of ply wood and strips in the usual manner, and are of good workmanship. Short ribs join the front spar to the leading edge, alternately with the true ribs.

The wing construction appears adequately strong. Steel compression tubes are placed between the spars, and are braced by ties varying from piano wire at the wing tips to cable and swaged rod at the inner end. The trailing edge consists of a flattened steel tube, to which the ribs are attached by copper rivets.

Ailerons are fitted to the upper wing only, which may in some measure account for that ineffectiveness of lateral



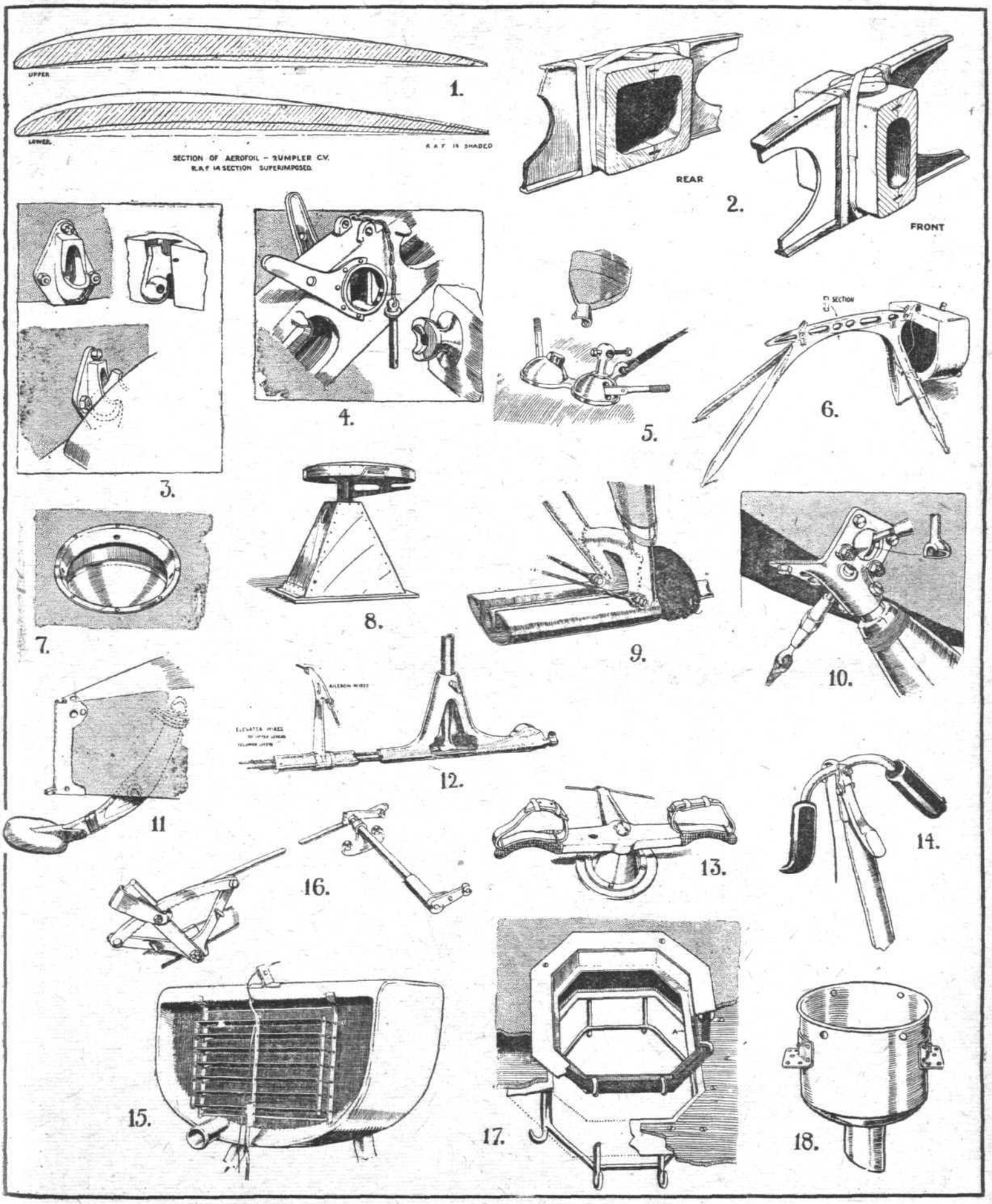
Rear view of the 2-Seater Rumpler.



THE 2-SEATER RUMPLER, C. 5 TYPE.—General arrangement to scale.

control which is characteristic of nearly all German aeroplanes. The area of each *aileron* is 15·3 sq. ft.

The methods of attaching the main planes to the upper *cabane* and to the *fuselage* are designed to assist rapidity of assembly and dis-assembly, and are of considerable interest. They do not differ from the arrangement on CIV machines, and may be considered, therefore, to have been found satisfactory in practice. From the Fig. 4 it will be seen that the upper wings are locked by means of a guillotine lever, held in position by a pin passing through both levers and through two holes arranged in the centre section. The lower wings are locked in position by even simpler means (Fig. 3),



THE 2-SEATER RUMPLER, C. 5 TYPE.—Figs. 1 to 18.

requiring no moving parts. The ball at the end of the spar is simply introduced into the socket fixed to the *fuselage*, and the wing tip is kept lowered. When the tip is raised, the top portion of the wing attachment slips into position, thus locking the wing in such a manner that, even before the attachment of struts and bracing, movement is possible in only one way—*i.e.*, by the dropping of the wing tip. A label bearing instructions and an explanatory diagram referring to these lower wing attachments is affixed on either side of the *fuselage*, near to the socket concerned.

Struts.

These are of circular section steel tube, encased in a wood fairing. A typical Rumpler strut attachment is shown in Fig. 5. The twin sockets are held down by two bolts, which pass right through the spars. The heads of these bolts are clearly shown.

The construction of the welded-up centre section *cabane* may be gathered from the photographs and from Fig. 6.

A cylindrical well of 3-ply and aluminium is incorporated in the lower wing close to the *fuselage* on the left side to accommodate the compass, which is thus convenient to the pilot's sight. Fig. 7 shows the construction of this well.

Fuselage.

The *fuselage* is a compromise between the several rival methods of construction. Wooden *longerons* and struts, braced with piano wire; steel tubes, and 3-ply are all used in varying degrees.

A braced girder of *longerons* and cross struts constitutes the principal factor, and this construction is depended upon entirely in the rear of the observer's cockpit. Towards the tail, for a distance of about 6 ft. from the sternpost, the covering is of 3-ply, which thoroughly stiffens up the *fuselage* where the stresses due to the tailplanes may be most severely felt. The middle portion of the *fuselage* sides—*i.e.*, between the 3-ply at the rear and the pilot's seat—has fabric covering, while forward of this 3-ply is again used.

The slightly arched top fairing is entirely of 3-ply, except for the aluminium cowl, which extends to the rear of the gunner's cockpit, as also is the bottom of the *fuselage*. The engine cowls are of aluminium, held in place by turnbuttons. From the rear of the observer's cockpit to the front of the pilot's seat the wood construction is reinforced by steel tubes, which have forked ends, and are bolted together.

The pilot's cockpit is particularly roomy and comfortably fitted. The gunner is provided with a seat of the piano-steel type with a rotatable head. This head is fixed on its shaft eccentrically, as may be seen by Fig. 8.

Landing Gear.

The undercarriage, of the usual V-type, while presenting few noteworthy features, is of workmanlike design and construction.

Both front and rear limbs are of stream-line section steel tubing. The upper extremities are placed well apart. At the lower extremities the tubes are welded together to form, together with the sheet steel axle fairing, the slot to accommodate axle travel. (See Fig. 9.) The front *limb*, which is of smaller section than the rear tube, is additionally faired with wood, while the rear limb is naked. The wood fairing has obviously been fitted as an after-thought, and not by the manufacturer. The job is clumsy and without finish, though effective. Landing shocks are taken by the familiar stee coil spring.

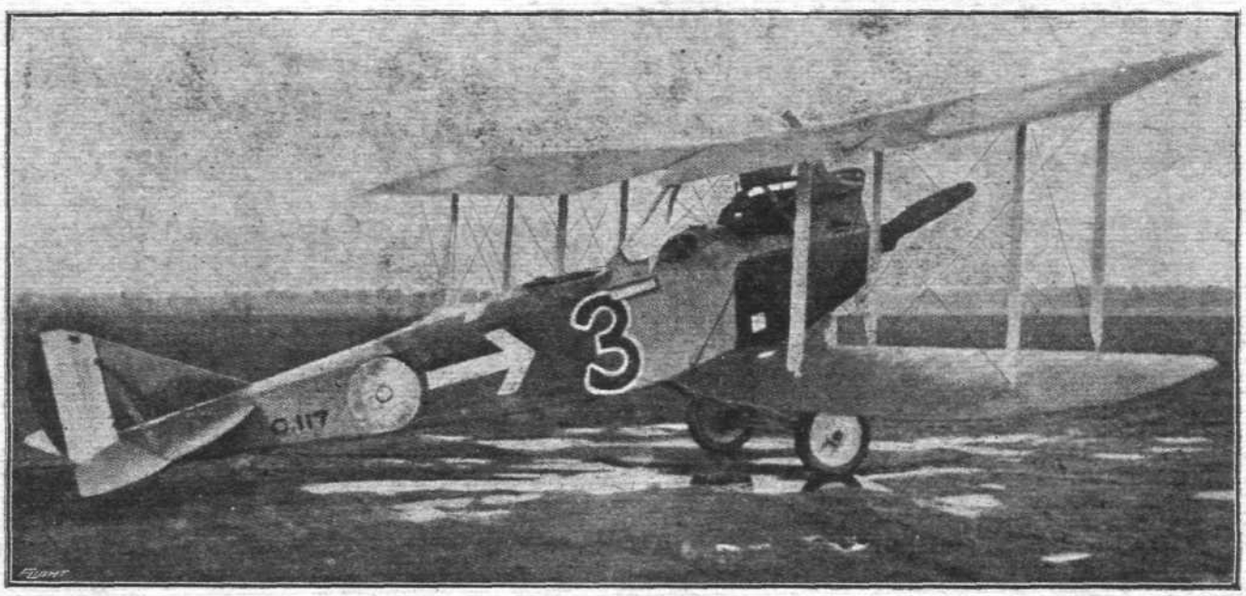
Four bracing wires are employed, connecting all four upper attachment points to the apices of the vees. Fig. 10 shows one of the front joints.

Tail.

The tail is practically of standard Rumpler—and, indeed, German—practice, but it is noteworthy that the elevators, which were of the balanced pattern in the CIV machine, are no longer so. As the longitudinal control is reported entirely satisfactory, it is evident that unbalanced elevators have been found all that is desired. The fin may hardly be regarded as adequate, in view of the side area presented in the nose of the machine, and the report that this aeroplane is somewhat liable to spin should be considered in this connection.

The four tail stays are of stream-line steel tube, and the lower pair have serrated edges to assist mechanics in remembering that these stays should not be grasped in lifting the machine or in holding it back on starting.

Although the fabric has not been removed, these members



Three-quarter rear view of the 2-Seater Rumpler.

—the fin, rudder, and elevators—appear to be constructed of light steel tube welded in the usual way.

The tail skid is of ash, pivoted in the centre, and sprung at its upper end. The lower end carries a sheet steel shoe, whose shape is shown in Fig. 11.

Controls.

The control system is of considerable interest, inasmuch as the usual transverse rocking shaft operating the elevator controls is not used. The *aileron* control is actuated by a longitudinal rocking shaft of steel tube, which carries a welded cone-shaped portion supporting the vertical control lever. The *aileron* cables are attached to a lever pinned to the rocking shaft, and pass through the wings, operating the *ailerons* in the way that has become usual in German aeroplanes—*i.e.*, the *aileron* lever lies in line with the plane, and is accommodated in a slot cut in the rear edge of the main plane.

The control cables pass over pulleys when they leave the lower plane to be attached to the *aileron* lever. These pulleys are situated behind the rear outer strut attachment, and are capped with a neat aluminium fairing.

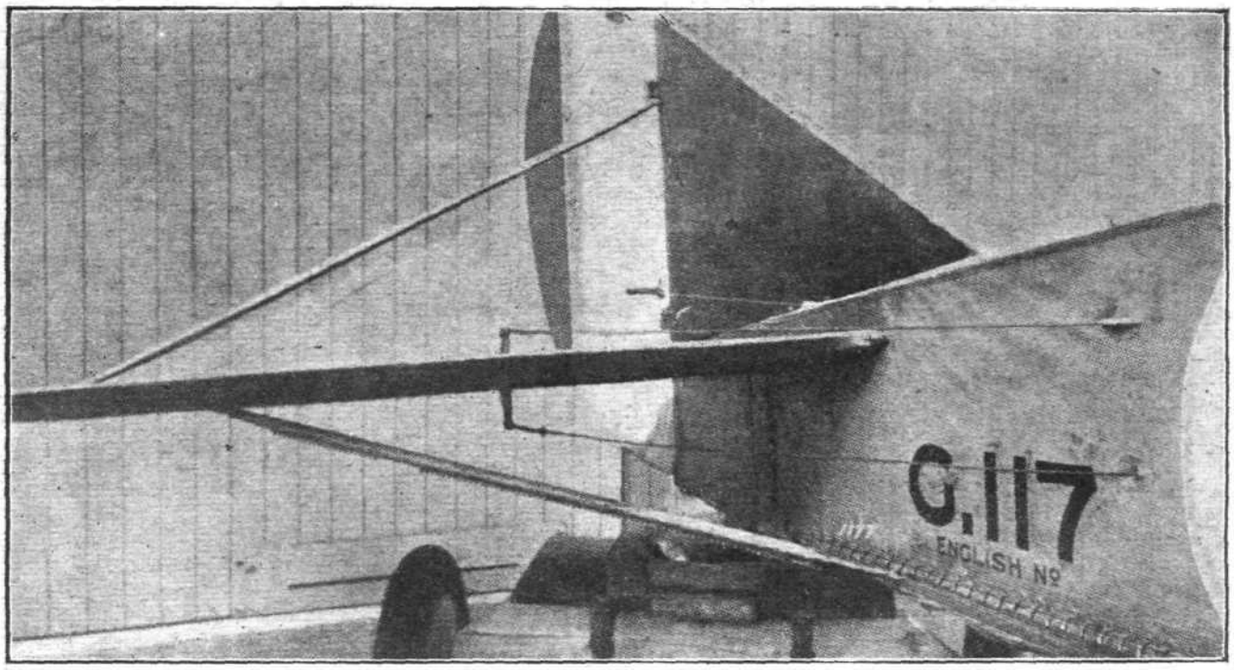
The control lever operates the cables attached to the elevator levers, those attached to the lower extremities of the levers passing over pulleys mounted in the front portion of the rocking shaft. This shaft projects somewhat below the level of the *fuselage* bottom, and is neatly faired off by an aluminium shield screwed to the *fuselage*. The control system should be made clear by Fig. 12.

A welded sheet steel rudder bar of simple pattern, shown in Fig. 13, operates the rudder through the usual cables.

The distance between the seat and rudder bar is not variable. Rubber sleeves and leather straps on either extremity guard against the possibility of the pilot's feet slipping.

Armament.

The pilot controls the fire of one fixed Spandau gun attached close to starboard side of the engine. The cocking lever is placed just outside the cockpit to the pilot's right. The gun

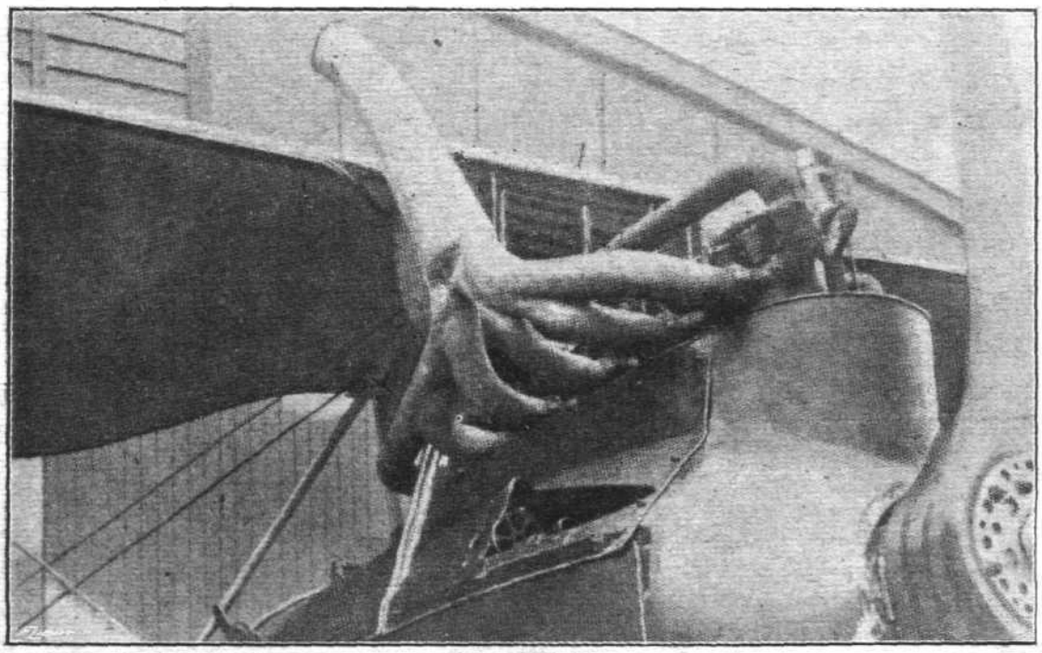


View of the 2-Seater Rumpler tail

itself is inaccessible during flight. A thumb lever shown in sketch (14) controls the fire through the usual clutch and synchronising gear.

The observer's gun is of the Parabellum type, and is mounted on the usual built-up wooden gun-ring, of the same kind as that found on most German machines.

Provision for the fitting of a bomb rack had been made, but none was fitted.



The exhaust manifold and engine cowling of the 2-Seater Rumpler.

An aluminium tray with holes for 10 Verey lights was fixed to the fuselage.

Engine.

The Rumpler is usually fitted with a 240 h.p. Maybach engine or a 260 h.p. Mercedes. The present example has 6 cylinder Mercedes of 260 h.p., which possesses the familiar combined throttle and altitude control. The exhaust gases are led into a welded manifold, the shape of which is indicated in the photograph.

Cooling System.

The radiator, made by Hans Windhoff, is slung over the rear portion of the engine, and fixed to the central *cabane*. (For photograph of the radiator and connections of the 2-seater Rumpler see Fig. 33 in the description of the Maybach engine, page 1035.) The honeycomb consists of circular brass tubes, expanded at their extremities into hexagons, and sweated together there. The total radiating surface is approximately 1.5 sq. ft. The shutters which regulate the cooling surface are shown in Fig. 15. They are operated by cables passing over pulleys. One cable passes over the top of the radiator, while the other exerts a downward pull and passes underneath. German pilots have reported that these shutters are rarely required except during protracted descents.

The temperature of the water is indicated by a mercury thermometer easily visible from the pilot's seat, and the limits of the permissible range of temperature are defined by red marks—one at 60 degrees and the other at 85 degrees. The radiator may be considered thoroughly satisfactory,

but must naturally obstruct the pilot's view to some extent.

The oil tank is situated at the port side of the engine, and the maintenance of an equable temperature of its contents is assisted by a thick covering of felt. The oil pump is embedded in the bottom of the crank case, and not only passes on the oil to the gudgeon pins and crankshaft, but at the same time mixes, at each pulsation, a certain quantity of fresh oil from the tank with the oil already in circulation.

Petrol System.

The main petrol tank—of 46 gallons capacity—serves as a support for the pilot's seat, while an auxiliary tank holding 13 gallons is fitted between the two cockpits, adapting itself to the shape of the *fuselage* top fairing and to the gunner's turret. Neither tank seems to possess baffle plates, and both work under pressure.

The initial pressure is obtained by means of hand pumps, of which there is one in each of the cockpits. An automatic air pressure pump driven off the crankshaft maintains the pressure, and a release valve incorporated in the pump regulates it. Each tank has its own pressure gauge on the dashboard. The petrol gauge on the main tank is of Laufer make, while a Maximall gauge is found on the auxiliary tank. All pipes on this machine are of copper, and the tanks of sheet brass.

Engine Controls.

Three 3-way cocks are fitted. They enable the pilot to shut off the petrol entirely; to supply from both tanks simultaneously, or to run on either of the tanks alone.

The throttle controls are shown in Fig. 16. The placing of the Mercedes carburettor at the rear of the engine facilitates the direct nature of the control.

The Deuta tachometer, working on the centrifugal principle, is driven off the camshaft, and is graduated from 0 to 1,600 r.p.m. It is not illuminated, and no normal is marked.

Propeller.

The propeller is an "Axial," No. 6987, diameter 3,150 mm., pitch 1,830 mm. It is secured to the crankshaft by eight bolts, an extra pair being fitted between two of the pairs of the usual six.

Wireless.

The machine is internally wired, and a tapping key is fitted to the gunner's right hand. The rack intended to support the aerial reel is also to be found, as well as a sheet steel dynamo shelf near the engine.

Cameras.

Two types of cameras were fitted. One particularly large one was accommodated in the special fitting shown in Fig. 17. The light octagonal tray A is suspended from the floor boards by elastic shock absorbers.

The zinc well shown in Fig. 18 carried the second camera. A light ply-wood tube, 30 in. long and 5 in. wide, is fixed to the rear of the observer's seat. It is obviously intended to carry some object, probably a Goerz bombing sight.

This machine is now at the Enemy Aircraft View Room, Agricultural Hall, Islington, where it may be seen on production of a pass, obtainable from The Controller, Technical Department, Ap.D.(L.), Pen Corner House, Kingsway, W.C. 2.

Aircraft Manufacturers and Excess Profits.

IN the last issue of FLIGHT brief reference was made to the increase of the Statutory Percentage which has been allowed to aircraft manufacturers in connection with Excess Profits Duty. As, however, that paragraph was somewhat ambiguous, and in order to avoid any misconception, we now reproduce the following order of the Board of Referees :—

The Society of British Aircraft Constructors, Ltd., whose registered office is at 1, Albemarle Street, in the County of London, W.1, having made application under Section 42 (1) of the Finance (No. 2) Act, 1915 (hereinafter called "the principal Act") to the Commissioners of Inland Revenue for an increase of the statutory percentage as respects the class of trade or business hereinafter defined, that is to say :

"The business of manufacturing aircraft (including both heavier than air and lighter than air) and/or aircraft propellers."

And the Commissioners of Inland Revenue having referred the case to the Board of Referees appointed for the purpose of Part III of these Acts by the Treasury, and the Board having heard the Applicants and the Commissioners of Inland Revenue by their duly-appointed representatives upon the merits of the said application, and having dealt with the case,

The Board doth order that as from the commencement of the principal Act the statutory percentage as respects the class of trade or business hereinbefore defined shall be increased :—

1. In the case of any trade or business carried on or owned by a company or other body corporate to 15 per cent. ;

2. In the case of any other trade or business—

(*a*) For accounting periods ending prior to the first day of January, 1917, to 15 per cent. plus 1 per cent. ;

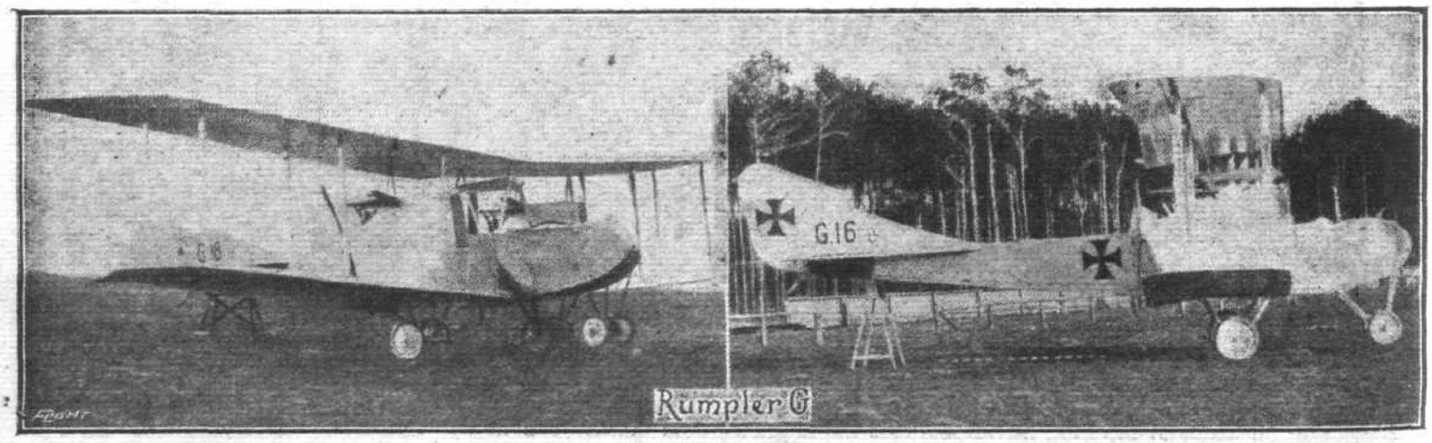
(*b*) For accounting periods ending after the thirty-first day of December, 1916, to 15 per cent. plus 2 per cent. ; except that for the purposes of subsection (2) of section forty-one of the principal Act the statutory percentage shall be 15 per cent. plus 1 per cent. ; with the addition, in cases 1 and 2 (*b*) for accounting periods ending after the thirty-first day of December, 1916, of 3 per cent. for the purposes of subsection (1) of section forty-one of, and paragraph 4 of Part II of the Fourth Schedule to, the principal Act.

Flying Surgeries in France.

ACCORDING to Mr. F. G. Falla, in the *Daily Mail*, a squadron of surgical aeroplanes is in course of formation in France. Each machine, in addition to the pilot, will carry an Army surgeon and X-ray operator, and a complete set of surgical and X-ray apparatus, including a folding aluminium table. Electric current for X-rays and for sterilising and so forth will be supplied by a dynamo. The intention is not to perform operations during flight, but to carry succour to badly wounded on any part of the battlefield.

German Machines Wrecked.

ACCORDING to the Dutch *Vaderland*, a wrecked German aeroplane and a portion of a second machine have been washed ashore near Westkappelle.



It appears that the Gotha and Friedrichshafen firms are not having a monopoly in twin-engined bombers, the above illustrations showing a machine produced by the Rumpler firm.—From the numbers painted on the *fuselage* it appears that this machine was built as long ago as 1915.

FLIGHT

THE 300 H.P. MAYBACH ENGINE.

Issued by the Technical Department (Aircraft Production), Ministry of Munitions.

(*Continued from page* 1000.)

Propeller hub.—The general details of the construction of the propeller hub are given in Fig. 22. Eight 15 mm. bolts are used to bolt the front flange to the two rear propeller hub flanges, and the propeller is secured by castellated nuts in the usual manner. The surface of the propeller hub and flanges is galvanised with deposited tin to prevent corrosion. The front flange floats on the propeller hub in four castellations, 17 mm. wide × 3 mm. deep. The total weight of the complete propeller hub, with all bolts, less extension flange on end of crankshaft = 21 lbs.

Crank chamber.—The photographs, Figs. 23 and 24, show clearly in perspective the general formation of the cast aluminium base chamber. Unlike most of the enemy aero engines, the bottom halves of the crankshaft main bearings are bolted to the top half of the crank chamber. These are very deep in section, and are secured to the crank chamber by 19 mm. diameter bolts, which pass through the crank chamber, and are also used to bolt down the cylinders by means of triangular clamps, now almost standard practice. Flanges are machined at the top end of the holding-down bolts, which are let into recesses cut in the top face of the crankcase. The front main bearing cap also carries below the intermediate gear pinion for driving the oil pumps as shown in the general arrangement of the engine. Cast aluminium covers are bolted to the front and rear ends of the crankcase for enclosing the camshaft driving gears at the front end, and for the magneto and interrupter gears at the rear end of the engine. Further details of the crankcase construction are shown in the illustrations. For an account of the various oil-ways drilled in the crankcase casting, see notes on lubrication in next column.

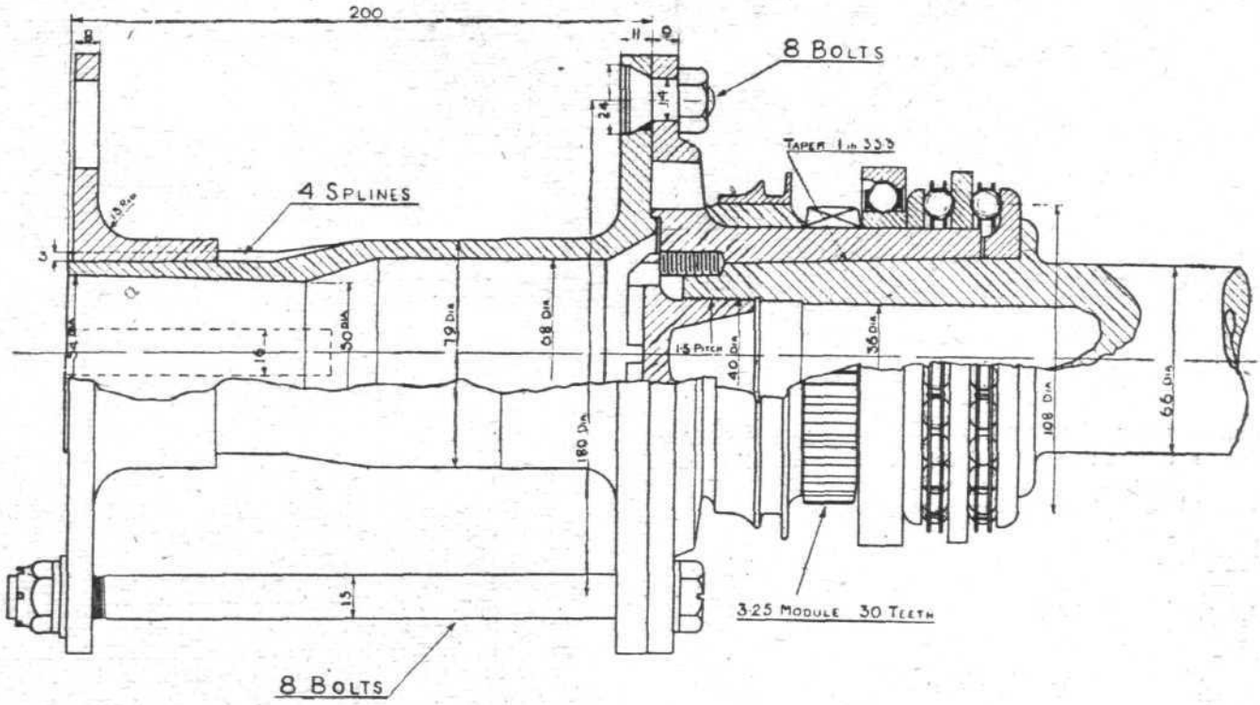


Fig. 22.—Details of propeller hub and thrust race.

Base chamber.—The general construction of the lower half of the crank chamber is shown in Figs. 4 and 25, and also in the sectional general arrangement drawing. It presents several points of interesting design, and is of simple construction, weighing 41·32 lbs. bare. At the rear end of the flange, which is bolted to the top half of the crank chamber in the usual way, extended brackets are cast for taking the two magnetos, and, as will be seen in Fig. 25, the three gear type oil pumps are situated on seatings cast on the bottom of the inside of the base chamber.

The small detachable oil sumps are fixed to flanges cast on the underside of the base, one at each end.

Details of the construction of the oil pumps and detachable oil sumps are given in the notes on lubrication.

Crankcase ventilation.—As in the Zeppelin-Maybach engines, the efficient ventilation of the crankcase has received careful consideration. The design is, in fact, very similar in both types of engine. On the induction side of the engine six breathers are fitted. These are constructed of fairly coarse brass wire gauge baffles mounted in sheet aluminium breathers which are attached to short steel tubular connecting lugs screwed into the crankcase, and are fixed in position by steel wire clips. Details of the construction of these breathers is shown in the sketch, Fig. 26.

On the exhaust side of the engine a peculiar type of ventilator is fitted. This consists of a sheet aluminium manifold, which is connected by six short rubber joints to the crank chamber. The top portion of the ventilator manifold is so made as to form an oil trap for the condensed vapour. This consists of an elliptical section pipe, which leads from the top of the chamber formed in the ventilator manifold to a cowl which projects backward from the outside of the engine cowling in the machine.

This crankcase ventilator is shown in the photograph of the engine (Fig. 2).

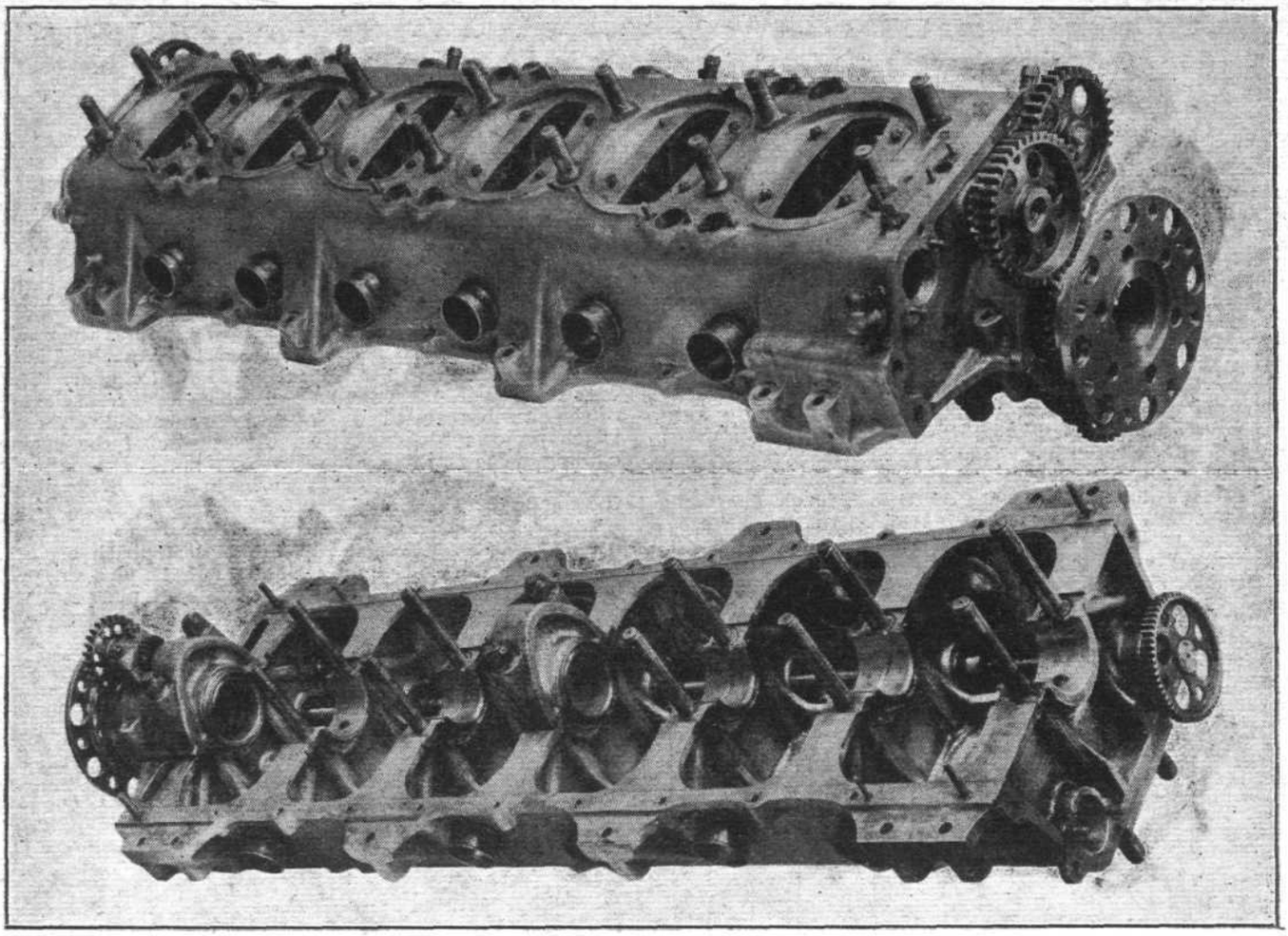
Lubrication.—Several details of the lubrication system have been completely redesigned in the new Maybach engines. The former single oil pump, which was of the plunger type, has now been replaced by three separate oil pumps of the gear type. These, as shown in Fig. 25, are fitted in the bottom of the base chamber. The main oil pressure pump is at the rear end, whilst the two scavenger pumps are situated one at each end of the base chamber.

The general principle of the lubrication system is here clearly shown in the special diagrammatic drawing, Fig. 27, which is to a great extent self-explanatory.

In this diagram the lubrication system is shown with all the oil pipes and oil-ways marked in black. The system briefly described is as follows: Oil is delivered from the separate oil tank by the pressure oil pump, which is the rearmost pump of the two at the rear of the sump, and forces oil under pressure to the crankshaft journal bearings through an external oil main, which runs the whole length of the crankcase on the induction side, as shown in Fig. 28.

From this main oil pipe oil is forced to the journal bearings through oil ways drilled diagonally in the crank chamber casting through the transverse webs which support the housings of the journal bearings; these are lubricated by a wide helical oil groove cut in the bearing white metal. For the lubrication of the crankpins and the connecting-rod small-end bearings the well-known Maybach system of centrifugal pressure lubrication is adhered to. In this system the oil, which is forced out through the ends of the journal bearings, is collected by the oil scoops, which are bolted to the outer sides of each crank-web, as shown in the view of the crankshaft (Figs. 20 and 21).

By centrifugal action the oil is forced up the outer surface



Figs. 23 and 24.—Top half of crank-case, and below, inside view of crank-case, top half.

of each crank-web and led through a channel into the hollow crank-pins, thence through a small hole bored radially in each crank-pin to the connecting-rod big-end bearings. From the big-end bearings the oil is forced upwards to the small-end bearings, with their floating gudgeon pin bushes of cast iron, through the steel pipe fixed in the centre of the connecting-rods. Details of this design have already been given. Fig. 31 is a detail sketch of one of the aluminium oil scoops, which are bolted in pairs to the crank-webs by a bolt which passes through the centre of the end crankpin.

From the front end of the main oil pipe a steel pipe is connected by a union, which leads to a hole drilled in the crankcase casting, and serves to lubricate the bearings of the camshaft intermediate gears. A restricting plug is fitted into the end of this oil lead, and a similar restriction is provided in the end of the main oil lead back into the crank chamber, as shown in the lubrication diagram.

A check valve, it will be noticed, is fitted in the main oil supply system. This check valve, together with a small spring-loaded pressure relief valve, is situated inside a small detachable valve chamber, which is attached to the bottom of the crank chamber just beneath the main oil pump. It will be noticed in the lubrication diagram that the excess oil pressure is delivered back into the oil pipe on the supply side of the pump. An oil pressure gauge is connected to the main oil lead as shown, and small oil pipes are also taken from the main pressure pipe to the small crank chamber of the petrol pump, and also to the water pump driving spindle.

The two scavenger oil pumps, situated one at either end of the base chamber, are designed so as to draw off the return oil which collects in the small detachable oil sumps in the bottom of the oil base, and to return it to the tank from either end.

These scavenger pumps are connected together by a steel

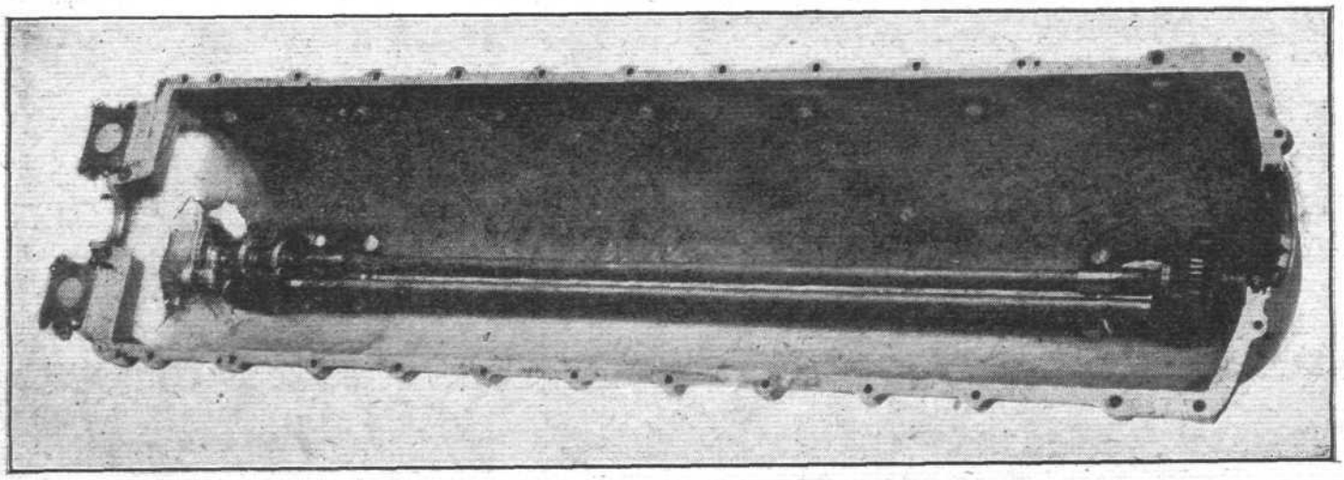


Fig. 25.—View of base chamber showing oil pumps.

pipe 21 mm. diameter, the ends of which are coupled to the suction ports of the two gear oil pumps. This inter-connection of the two pumps to a certain extent balances the oil

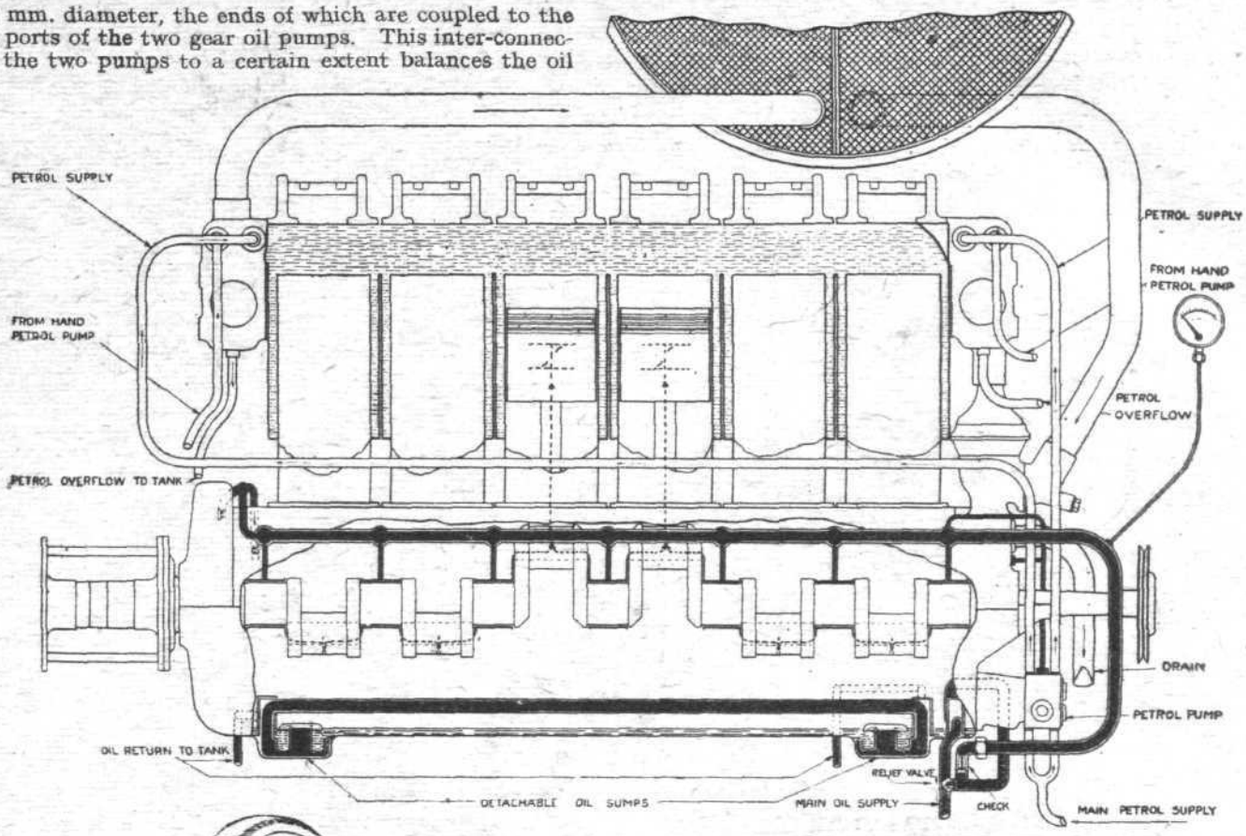


Fig. 27.—Lubrication diagram, also showing petrol system and water circulation.

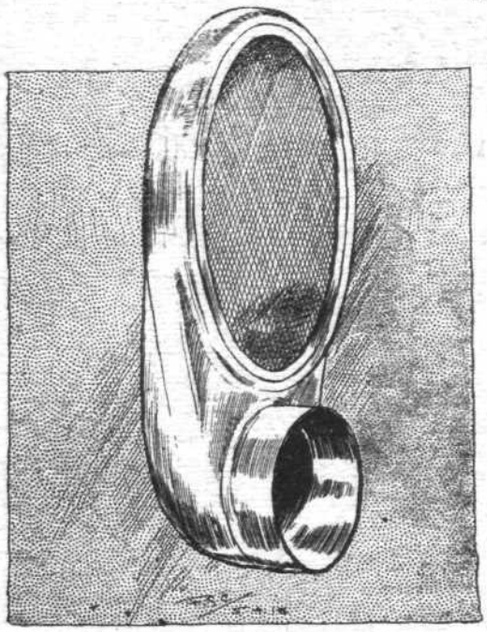


Fig. 26.—Crankcase breather.

return to the tank from the front and rear ends of the oil base, enabling both scavenger pumps to operate at any angle of the engine.

A small quantity of oil is always carried in the oil base, as shown in the lubrication diagram. The camshafts, tappets and cylinder walls are splash lubricated by the surplus oil thrown off the crankshaft and oil scoops; and the camshaft and magneto gears are lubricated through oil ways cut in the camshaft bearings at either end. Baffle-plates are fitted below the cylinders in the recesses machined in the top face of the crank chamber, as shown in Fig. 30.

Constructional details of oil pumps, &c.—No provision is made for lubricating the roller bearings of the overhead valve rocker spindles, and no oil holes are made in their brackets for hand lubrication.

The general design of all three oil pumps and their delivery is the same. The general construction is clearly shown in the sketch of the front scavenger pump (Fig. 29). A pair of

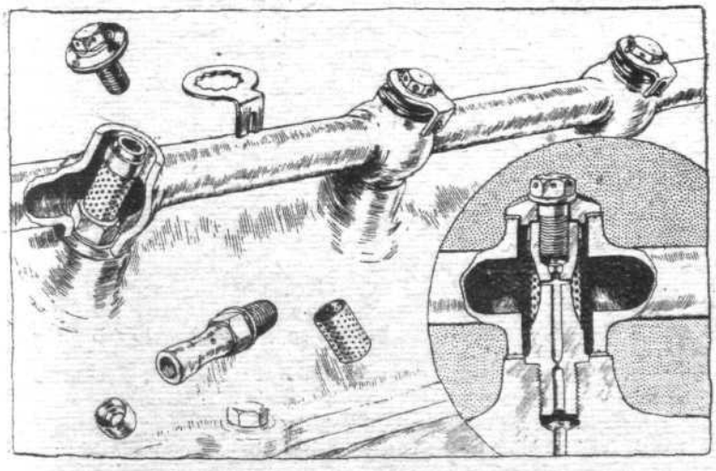


Fig. 28.—Sketch of oil main and oil filters.

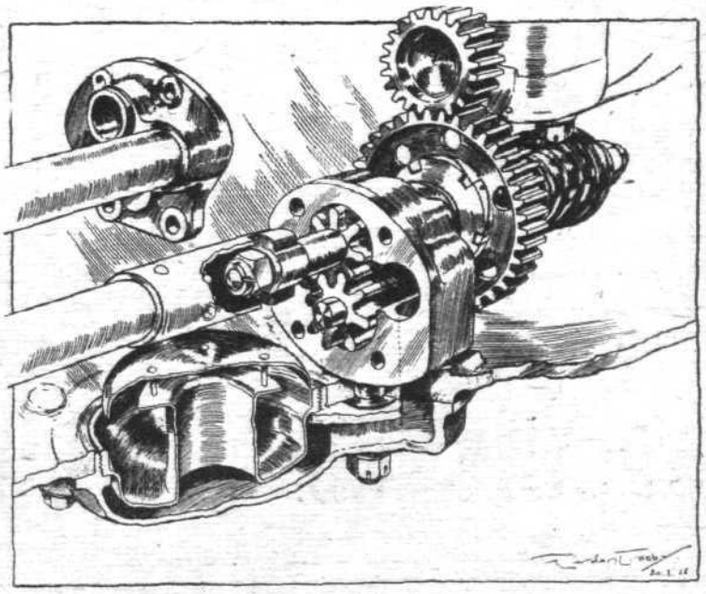


Fig. 29.—The front oil pump, showing ratchet drive and section of detachable oil sump in chamber. (See general arrangement of drawing.)

pump gears of the usual formation, 30 mm. diameter, work in a body casting of cast iron. The top pump gear is of steel, and is machined integral with the driving spindle of the pump, whilst the lower pump gear is made of gunmetal. The oil pumps are secured to the machined seatings cast on the bottom of the oil base by a stud in each case, which also serves to hold the small detachable oil sumps in position.



Fig. 30.—Sketch of top half of crankcase, showing journal bearings and oil passages.

These oil sumps consist of aluminium castings, into the cupped centre of which is screwed a spun brass oil trap, formed as shown in the sectional perspective sketch. These oil sumps are connected to the suction ports of the oil pumps by a passage formed in the sump body castings.

All three oil pumps are driven at the same speed, the two scavenger pumps being connected together by a light tubular

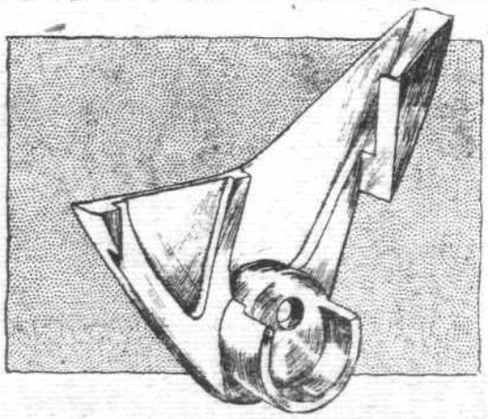


Fig. 31.—Sketch of one of the oil scoops attached to the sides of the crank-webs for conveying oil to the crank-pins.

shaft, which engages with dog clutches at either end: the pressure oil pump is driven off the spindle of the rear scavenger pump through a dog clutch extension of the spindle.

The method of driving the oil pumps at the front end of the engine is of interesting and unusual design. As shown in the sketch (Fig. 29) the driving gear wheel, which is mounted on the front extension of the pump spindle, is provided with a spring-loaded face ratchet, the teeth of which are cut inside the gear as shown, and engage with similar teeth cut on a flange on the front of the pump driving spindle. The strength of the spring is such as to allow the driving gear to overrun the driving spindle, and apparently, in the event of back-firing, all the oil pumps become inoperative, and would thus be prevented from being sucked back into the oil base by the two scavenger pumps.

An interesting feature in the lubrication system of these engines is found in the small separate oil filters, which are provided at the top of each of the diagonal oil-ways drilled through the webs of the main journal bearing housings. The small filters are screwed into the bosses, which are cast on the outside of the crank chamber, and to which the detachable main oil pressure pipe is attached.

In Fig. 28 the method of attaching the main oil pipe by a setscrew and a cap fitted with a leather washer is shown. The setscrew is screwed into the top of the filter plug at

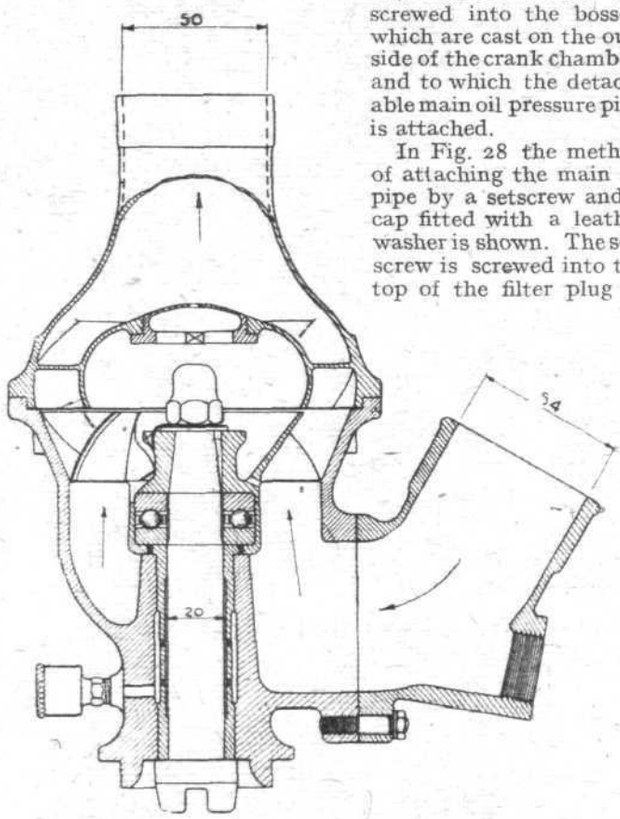


Fig. 32.—Section of water pump.

the top of the drilled oil lead, and a small jet or drilled plug is fitted below the setscrew, the plug being let into a small recess cut in the top of the oil lead. The bore of this plug corresponds to the bore of the restriction formed in the oil lead drilled in the filter plug just below, as shown. This device is apparently provided to allow for a special plug to be attached in place of any of the six setscrews, which can then be coupled to a pressure gauge, thus giving the oil pressure at any of the main bearings.

Further details of the formation of the oil passages drilled through the crankcase to the journal bearings, and also of the construction of the main bearing caps, are given in the sketch Fig. 30, which shows the underneath view of the top half of the crank chamber. The oil is led round the bearing bolts through circular oil grooves cut in the face of the bearing housings. The small holes, drilled in the crankcase above the joints, as shown, communicate with recesses machined around the bolts. These holes are made to prevent the oil from being forced upwards out of the engine through the bolt holes in the crank chamber.

Water pump and water-cooling system.—Details of the construction of the water pump are shown in the sectional drawing, Fig. 32. The body of the water pump is attached to the top face of the separate aluminium casting which forms the cover of the magneto driving gears. This gear cover is attached by bolts and studs to the rear end of both the top and bottom halves of the crank chamber. As may be seen in the general arrangement drawing of the engine, the water-pump spindle is driven through a dog clutch at its lower end by a short vertical spindle running in a bronze bush bearing; this spindle is driven by a bevel gear meshing with the main bevel fixed on the rear end of the crankshaft.

The water pump vertical spindle, which is 20 mm. in diameter, runs in a bronze bearing, which is lubricated by a

screw grease lubricator. The top portion of the pump spindle bearing is cupped to form the housing for a thrust ball-race, above which is fixed the pump rotor.

The pump rotor is a gunmetal casting, having six helical vanes 110 mm. in diameter. The rotor is fixed to the pump spindle on a taper and key, and is locked by a domed nut and locking washer.

The lower half of the pump body is an aluminium casting with an inlet passage 54 mm. in diameter, to which the diagonal water pipe from the radiator is coupled by a rubber connection. The top half of the water pump body, which is a gunmetal casting, is formed with six helical passages leading in a reverse helical direction to the water-pump rotor. These passages connect with the common vertical outlet passage in the top of the body casting as shown in Fig. 32. The outlet diameter is 50 mm.

The centre portion of the top body casting inside the helical passages above the pump rotor is domed and fitted with a screwed plug 38 mm. in diameter. This plug is drilled with a 3·5 mm. hole, evidently to prevent an air-lock. Two 3 mm. holes are also drilled in the bottom of the rotor between the vanes for the same purpose. It is noticeable that the steel ball thrust race is working to all intents in the water flow, and must, therefore, suffer by corrosion.

Water circulation.—The circulation of the water-cooling system is clearly set out in the diagrammatic drawing Fig. 27, from which it will be seen that the water pump delivers directly into the bottom of the water jacket which surrounds the body of the rear carburettor. As already mentioned, the two carburettors are attached by long studs to the ends of the front and rear cylinders, and the water, after passing through the rear carburettor water jacket in a special passage round the throttle valve, enters the rear cylinder through the two circular water joint flanges. The water passes through the passages cast in each of the six cylinder heads to the front carburettor water jacket, whence the water is forced out through a vertical passage 50 mm. diameter through a diagonal pipe leading to the radiator, which is slung above the engine from the centre section of the top plane.

The radiator is of entirely new design, and is shown in the photograph (Fig. 33) fitted to a 260 h.p. Mercedes engine. Unfortunately it has been impossible to carry out any tests on this interesting type of radiator, a separate report on which will be issued later.

According to a French report, this radiator is very efficient. It is of semi-circular shape in front elevation, and is formed of hexagonal honeycombed tubes, and exceptionally deep in cross section, measuring 22 cms. The radius of the semi-circle in elevation is approximately 32 cms.

The radiator is divided into two separate sections by a vertical baffle plate, as shown in the diagram Fig. 27. Water enters the bottom of the left-hand side of the radiator through the pipe leading from the front carburettor, and flows upwards through the tubes of the left-hand of the radiator to the top portion of the tank which completely surrounds the radiator. The water passes over the top of the dividing baffle plate, through the right-hand section to the bottom of the radiator, and out at the rear side, which is connected with a 50-mm. pipe to the inlet passage of the water pump.

As will be noticed, the front of the radiator is fitted with a blind, which is operated by a cable from the pilot's seat.

Ignition.—The two Bosch Z.H.6 type magnetos are mounted on brackets cast on the rear end of the base chamber, and are driven at 1·5 : 1 engine speed directly off the rear end of the camshafts. The ignition point is set 38° early. Two Bosch 3-point plugs are somewhat inaccessibly fitted in the head of each cylinder between the twin water connections as previously described. The plug bosses are water-cooled. The high-tension cables are carried in fibre tubes bolted to the cylinders, and the leads to the plugs are taken through fibre blocks mounted on the sheet-metal brackets on the cylinder heads.

Order of firing : 1–5–3–6–2–4.

(To be continued.)

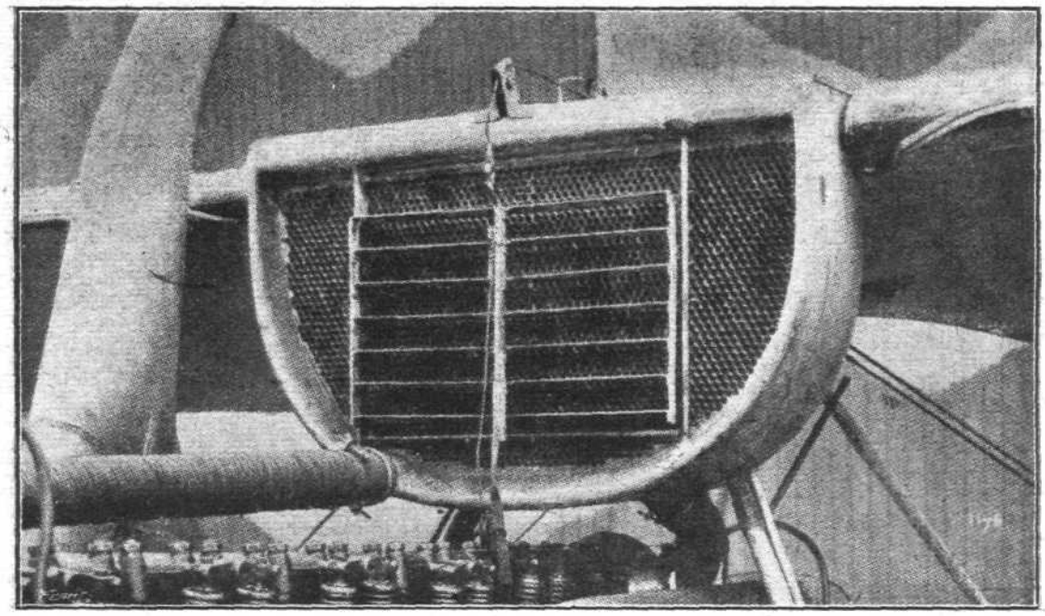


Fig. 33.—Radiator fitted to centre section of Rumpler biplanes, as used with 300 h.p. Maybach and 260 h.p. Mercedes engines.

Back from Germany.

THE following officers who were prisoners in Germany, have now arrived in England :—

Daly, Capt. A. P. V., Conn. Rang., attd. R.F.C.
Hume, Lieut. S. S., Yeo., attd. R.F.C
Neill, Lieut. J. W. F., R. Scots, attd. R.F.C.

How Durazzo was Blocked.

As a result of the aerial bombardments of Durazzo, the entrance to the port is stated to have been obstructed by a sunken vessel. All the interior of the port is full of crushed hulks.

From Glasgow to Canada.

UNDER the auspices of the Lord Provost a fund has been opened in Glasgow to raise £2,200 in order to present a "City of Glasgow" aeroplane through the Imperial Air Fleet Committee to the Dominion of Canada.

A Noted Austrian Killed.

IT has been announced in the Austrian newspapers that Lieut. Count Herberstein, the leading Austrian pilot, was recently killed by an Italian aviator in an air fight over the Piave.

A Squeal from Turkey.

THE recent air attacks on Constantinople have not been without effect, apparently, and the *Vakit*, in advocating reprisals against enemy civilians in Turkey, adds that those who fall under the agreement regarding the exchange of prisoners of war should not be allowed to leave until an absolute guarantee against a repetition of air attacks has been given. The newspaper further recommends the internment of all enemy civilians, and that the houses of the latter should be handed over to the families which have suffered by these air attacks.

According to information received in Zurich, 250 houses were burnt as a result of the air raid on August 27th, and 500 more were destroyed in the raid on the following day.

AIRISMS FROM THE FOUR WINDS.

IT comes as somewhat of a shock to Bumbledom, the refusal of reimbursement to Metropolitan Borough Councils by the Government of the cost of making good damage to public works, sewers, and other underground works through enemy air raids. Like a good many more taxpayers, the councils accepted as only natural that damage from air raids was by way of being a national war charge. And now they find they're wrong. Information of the existence of a Government aircraft insurance scheme may not yet have penetrated to these august bodies, and we therefore mention its existence on the off-chance. It takes the cost off the individual borough and reduces the Government profit on their scheme, or at worst places the loss on the shoulders of the community at large.

FONCK, the great French Ace, is credited with such keen eyesight—to which gift he ascribes much of his success in the air—that he can see almost as well at night as in daylight and drives a motor car without lights at 40 miles an hour on a dark unknown road without hesitation. The story-teller does not say if there is any hesitation on the part of the other fellows on the road, but for our own part we're glad we don't live near Fonck's dug-out.

No wonder there was music in the air the other day from the Frankforters. According to a contemporary, one of the Allies' bombs managed to find the big Frankfort Opera House!

THERE is a considerable field opened up for almost limitless exploitation in the suggestion made by the London County Council for incorporating Gotha Street and Victoria Street, Hackney, under the name of Warneford Street, in honour of this British pilot of Zeppelin destroying fame.

CANON MAY sends us the following "Hymn for Airmen," which has been found to meet a growing want, and which he asks us to help to make better known. The spirit throughout the five verses will be echoed by all those whose dear ones are forward to bring retribution to the Hun beast :—

O Lord, uphold the men who fly
On slender wings 'twixt earth and sky ;
Give steadfast hearts, and skilful hands,
For all their dangerous task demands.

As high they soar o'er land and sea,
May each feel still more near to Thee ;
Their stay Thine everlasting arms,
'Mid all the stress of war's alarms.

Never alone, since Thou art there ;
Nor oft cast down in doubt or care :
Their shield and buckler mayest Thou be,
Their only fear the fear of Thee.

Grant quickened eye and ear and brain ;
Firm mastery o'er fatigue and pain ;
Foresight and courage so combined,
That all their aims achievement find.

So, as from earth and sky ascend,
Glad hymns of praise that have no end ;
So, Thine the praise from those who fly,
On slender wings 'twixt earth and sky.

AMEN.

For the further information of our readers, Canon May mentions the tune applicable as Melcombe, No. 4, Hymns A. and M.

FOR EMBRYO CADETS.—Mr. E. J. Wignall, the Registrar, East London College (University of London), has sent the following suggestive, if somewhat lengthy, note of interrogation, to the Press for publication :—

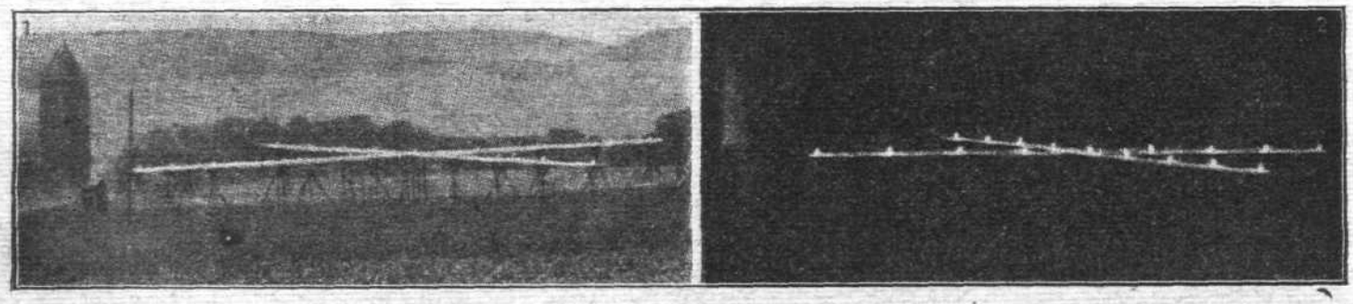
"Will your readers whose sons are disappointed at finding they are too young by about six months to be accepted as cadets in the R.A.F. apply to me for a copy of an address delivered by Brigadier-General J. G. Hearson on the Training of Air Pilots, and also for particulars of the Special Preliminary Course in Aeronautics, Science, and Engineering which has been instituted by the Council of this College after consultation with officials of the Air Force?"

THERE is a fat and well-favoured individual, dressed like a respectable workingman, who works a little game in the vicinity of Aldwych which seems to pay him better than work. He accosts Colonial and American soldiers, and shows them a fountain pen which he says he has just picked up, and as it's "no use to me, Mister," he will take half-a-crown for it. He acts his little part very well, and slyly represents that he believes the pen to be of a well-known make, and doubtless worth half-a-guinea. As a matter of fact, it is a cheap Japanese article, ordinarily retailed at sixpence. I noticed him only a day or so singing this syren song to a couple of easy-going American air mechanics, who were already beginning to fumble in their pockets for the needful silver. Surely this game is not outside the law? The police might do well to pay this individual a little attention.

UNHONOURED prophets, like the poor, are always with us. Not least among them is a scribe who tells us in "Coming Fashions" (next to the announcement of a new hair net: "Requires Only Two Pins, No Untidy Ends") that years ago he (or she) was alone in the public press to prove the superiority of the aeroplane over the dirigible balloon. Of course it was his (or her) own fault for sandwiching these brain children between the tips on eggless puddings and the answers of Aunt Jane to the lovelorn.

The writer confides in us that he intended to increase "the factor of stability in flight by hinging the front portions of the wing of a monoplane so that they could fold back automatically under the pressure of the wind, thereby increasing the speed of the machine in proportion to the reduction of the area of resistance and also the general stability."

Q.E.D., as Euclid, friend of our youth, used to say. We should be at one with the writer, if *she* (we are sure of it now) had put in a claim for making looping-the-loop practicable, in fact inevitable, some years before that feat was accomplished!



Two photographs of the Cross of 17 lamps erected close to the Chateau of Porrentruy in Switzerland to indicate the Swiss border to aviators. Its erection has aroused a good deal of criticism locally, one objection being that the lines of light might be mistaken for a railway station and bombed.

AMONG the "matters which they order better in France" are the descriptions of the "glorious destructions" of the allied fighting pilots. A certain "verve" in which we are lacking, and a prodigality with exclamation points which outdoes the excellent Dumas, marks their work.

Listen :—

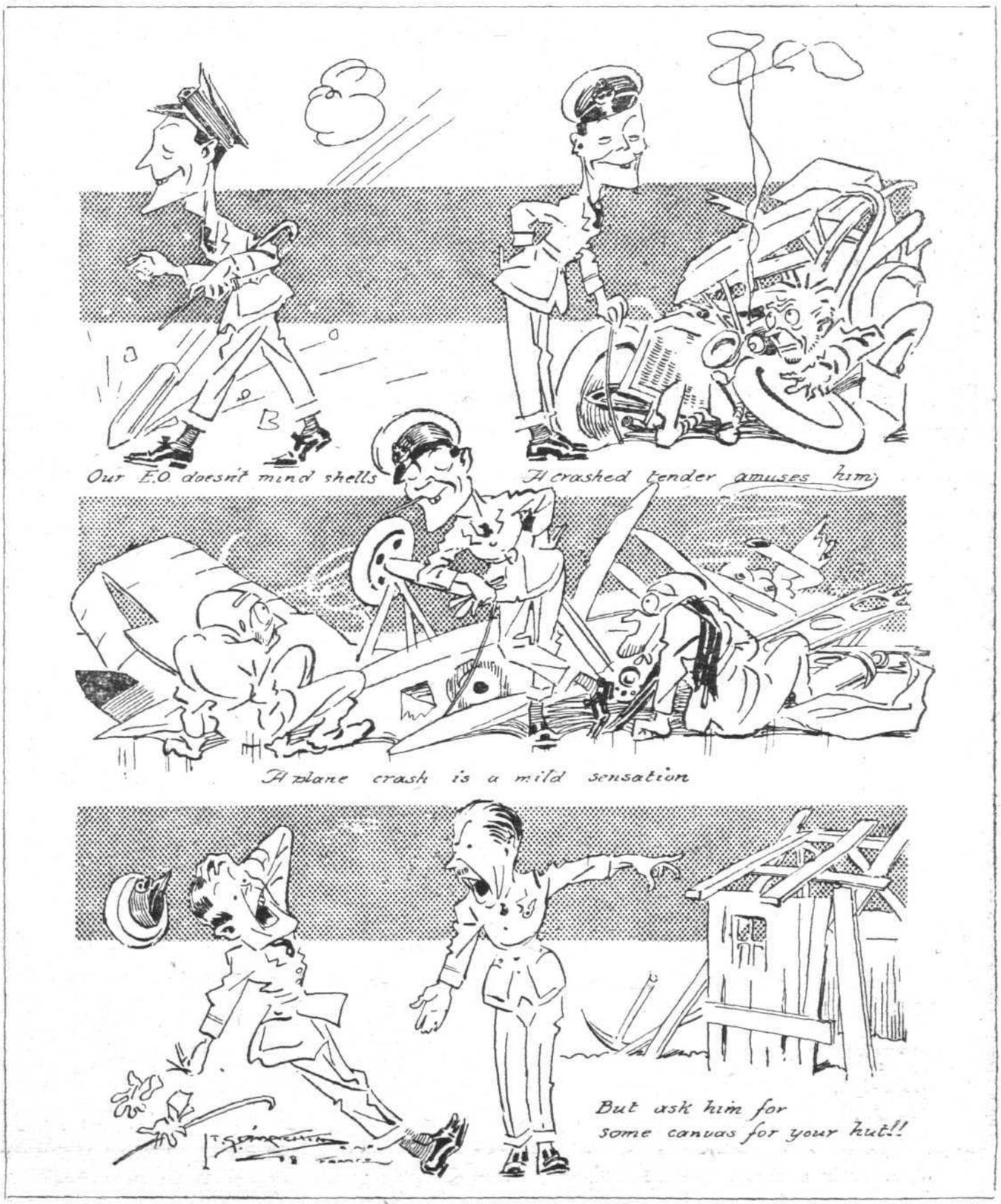
"Lenoir swoops on the kite balloon, which, with insolently distended cheeks, waits there, shivering at the end of its string!"—"the vast Aviatik, descending, opens, bursts into a rose of flame, and crumbles into space."

The pilot speaks :—

"Having spotted a Boche, I precipitated myself after him, drew up, and opened fire at point-blank range. He fell without sorrow; he could not resist me, I assassinated him. So much could not be said for my scrap of the 25th September. There, truly, I experienced the shiver of death. It was a Boche three-seater, each passenger operating a mitrailleuse. And you can bet they worked in unison. *Fichtre oui!* How did my baby Nieuport get the better of this flying house? How was it that the explosive bullet which chipped my eye socket did not blind me? How, with all the wounds that my *avion* received, did I get back? How did I, David, succeed in scattering this Goliath in space? I know not, I.

"This I know, the intense joy, the enfolding delirium which filled me when I saw the end of the encounter. My victim fell on a hillside, bounding like a rabbit. They had smashed two of my cylinders, percolated the petrol tank, and cut a spar and two wires. To show how close it all was, I may tell you that the blood of the Germans had spattered my machine, the wings and cowl were dripping. . . ."

The light-hearted gallantry of it!



The Squadron Equipment Officer.



Casualties.

Lieut. EDGAR BRANDON, R.A.F., aged 29 years, reported killed on August 11th, was the youngest son of the late Edgar Brandon and Mrs. Brandon, of Newlands, Clapham Road, Bedford. Educated at Bedford School, at the age of 21 years he went to Tasmania, and remained there until 1913. He then went to Ceylon, where he was for some years with the Ceylon and Indian Planters' Company. On returning to England he joined the Inns of Court O.T.C. of September 27th, 1917, afterwards obtaining a commission in the R.A.F. He crossed to France in July.

Major AUDSLEY RALPH CARTER, R.G.A., who was mortally wounded on August 28th, was the youngest son of Dr. and Mrs. Godfrey Carter, of Sheffield. He entered Woolwich in March, 1911, and received his commission in the R.G.A. at Portsmouth in 1913. In the autumn of 1914 he went to France to join a heavy battery, and served with it through most of the great battles. He was appointed adjutant of a brigade a year ago, and became *liaison* officer to a wing of the R.A.F. He received the 1914 Star, and took part in this last British offensive. Major Carter was a grandson of Capt. Duncan Grant, R.N., whose brothers were the late Admiral Henry Grant, C.B., and A.D.C. to Queen Victoria, and Admiral John Grant. He was the sixth generation to serve in His Majesty's Forces.

Sec. Lieut. JASPER EDMUND CAVE, R.A.F. (transferred from Canadian Seaforth Highlanders), late of Rock Creek, British Columbia, who was killed in action on August 14th, was the only son of Edmund and Blanche Cave, of 9, Marble Arch (formerly of St. John's Wood). British Columbia papers, please copy.

Lieut. THOMAS FATTORINI, R.A.F., who was killed in action on August 13th, aged 19, was the son of Thomas Fattorini, of Rockwood, Skipton, Yorks.

Major ARTHUR WILLIAM KEEN, M.C., R.A.F., who died on September 2nd from injuries received on August 15th whilst flying on active service, was the eldest son of the late A. T. Keen, Esq., J.P., and Mrs. Keen, of Harborne Park, Birmingham.

Lieut. LEWIS JOHN FRANCIS OERTLING, R.A.F., who died on August 8th, at a regimental aid post, of wounds received in action on that date, was the husband of Ursula Oertling, 13, Gatwick Road, Wimbledon Park, S.W., and only son of Mr. Henry Oertling, of The Hermitage, Barnes, S.W., aged 27.

Capt. A. DUDLEY TAYLOR, R.A.F., who was killed on active service, on August 24th, was the eldest son of Mr. and Mrs. T. T. Taylor, of Crowstone, Blake Hall Road, Wanstead, Essex, aged 25.

Capt. J. M. CHILD, M.C., Man. R. and R.A.F., who was accidentally killed on August 23rd, aged 24, was the second son of Mr. and Mrs. Child, of King's Road, Leytonstone. He went to Canada and took up banking and mining prospecting. He enlisted in the Canadian Militia, and not being able when war broke out to leave with either the First or Second Canadian Contingent, came over at his own expense, and obtained a commission in the Durham Light Infantry. As he was not sent to the front, he got transferred to the R.F.C., and for his work he was mentioned in despatches, and won the Military Cross, the decoration of Chevalier of the Order of Leopold, and the Belgian Croix de Guerre. Later he secured a permanent commission. He met his death in Scotland after an endeavour to rescue fellow officers from an aeroplane accident.

Capt. W. GORDON COPE, R.A.F., who was killed on September 5th, in an accident in Hants., was the husband of Doris Cope (*née* Shephard), 30, West Heath Drive, Hampstead, and only son of Mr. and Mrs. Walter C. Cope, Carson House, Finchley.

Sec. Lieut. BRIAN GERALD MAHONY, R.M.F., attached R.A.F., who was killed in a flying accident on September 3rd, aged 28 years, was formerly of Taneatua, N.Z., and Late, Tonga.

Married.

Capt. ARTHUR FELLOWES BUCK, R.A.F., second son of Dr. and Mrs. Buck, Harrow-on-the-Hill, was married on September 9th, at Highgate Presbyterian Church, to MARY, daughter of Mr. and Mrs. MITCHELL NICOLL, Claremont, Orleans Road, Crouch End, N.

Sec. Lieut. F. DOUGLAS CHAPPELL, R.A.F., was married on September 5th at St. Martin's, Dorking, to VERA AGNES, daughter of the late W. SYMES HARRIS and Mrs. HARRIS, of Redcote, Dorking.

Major NORMAN DEAKIN, Yeomanry (attached R.A.F.), was married on September 3rd, at St. Marylebone Church, to EDITH KATHLEEN DE LA POER, only daughter of Col. C. F. C. BERESFORD, late R.E., Kilmore House, Camberley.

Lieut. RICHARD B. DONOVAN, West India Regiment, attached R.A.F., only son of E. W. Donovan, of Prestwich, Lancashire, was married on September 3rd, at Bath, to EDITH MADALINE, eldest daughter of JAMES COPP, of Apperley, Gloucester.

Capt. IVOR GLYN ELIAS, R.A.F., eldest son of Mrs. and Mrs. Davy Elias, Caerphilly, was married on September 6th, at St. John's Church, Woking, to MARJORIE WINIFRED CHIDELL, elder daughter of Mr. Charles A. Chidell, of Hook Hill, Woking.

Lieut. ALEXANDER CHARLES HUTCHINSON DASHWOOD, R.A.F., only son of C. E. Dashwood, M.R.C.S., L.R.C.P., and Mrs. Dashwood, of Villa San Pancrazia, Taormina, Sicily, was married on August 31st at Clifton Parish Church, by the Rev. R. A. Bosanquet, to EVELYN GRACE VINCENT, daughter of Mr. and Mrs. P. FOSBERY, of Lapford, North Devon, and grand-daughter of the late H. T. Chamberlain, of Clifton, Bristol, and the late Col. G. V. Fosbery, V.C.

Lieut. DOUGLAS LILLINGTON JENKINS, Indian Army R. of O. and R.A.F., youngest son of the late Oswald Jenkins and Mrs. Jenkins, of Little Aston, Sutton Coldfield, was married on August 28th, at St. Peter's, Bexhill-on-Sea, to LEILA MAUDE, younger daughter of the Rev. and Mrs. A. ROTHWELL GREGORY, late of Ulgham Vicarage, Morpeth, and niece of Sir Philip Watts, K.C.B.

Lieut. JOHN GEORGE MORRIS MANN, R.A.F. (late R.N.V.R.), son of the late Mr. and Mrs. A. J. Mann, of Bedford Park, W., was married on August 31st, at St. Columb's Church, Notting Hill, to SYBIL LUCY JOHNSON, B.A.Lond., only daughter of the late Frederick and Mrs. Johnson, of North Kensington.

Capt. T. M. B. NEWTON, Royal Berks Regt. and R.A.F., son of the late T. E. Newton and Mrs. Newton, Winchester, was married on September 4th, at the Parish Church, Farnham, to EDITH MARJORIE, elder daughter of Mr. and Mrs. H. C. FOLKARD, Farnham.

Capt. W. STORMONT, R.A.F., elder son of Mr. and Mrs. L. Stormont, of 60, St. George's Road, S.W., was married on Tuesday, September 3rd, at St. Columba's, Pont Street, S.W., to BETTY, youngest daughter of the late Wm. HAZELL and Mrs. HAZELL, Broughty Ferry, Scotland.

Lieut. JOHN H. A. WILMOT, R.A.F., son of T. G. H. Wilmot, of Barnes, S.W., was married on August 30th, at Montreal, Canada, to BERTHA, daughter of Mrs. MCCULLY, of Montreal.

To be Married.

The marriage arranged between Lieut. STUART L. MATTHEWS, R.A.F., son of Lieutenant-Colonel W. H. Matthews, D.S.O., of Wimbledon, and MARCIA NEVA, daughter of JAMES DIETRICHSEN, The Pollards, Loughton, Essex, will take place at St. Mary's Church, Loughton, on Saturday, September 14th, at 2.30.

The engagement is announced of Lieut. GORDON TAGGART, R.A.F., late Transvaal Horse Artillery, third son of the late John Taggart and of Mrs. Taggart, Queenstown, South Africa, to ERICA, eldest daughter of Mr. and Mrs. ESSEX, Bilton, Rugby.

Items.

LADY ROTHERMERE and SIR CHARLES WAKEFIELD have become vice-presidents of the Poetry Society.

FLIGHT
& AIRCRAFT ENGINEER

THE ROYAL AIR FORCE

London Gazette, September 3rd.

The following temporary appointments are made at the Air Ministry :—

Staff Officer, 1st Class.—(Air.)—Maj. (Temp. Lieut.-Col.) G. P. Grenfell, D.S.O., and to retain his temp. rank while so employed ; Aug. 17th.

Staff Officers, 2nd Class.—(Air.)—And to be Temp. Majs. while so employed if not already holding that rank :—Capt. C. L. Bullock, Capt. A. G. Clarke, Capt. (Temp. Maj.) Hon. L. G. W. Guest, Capt. P. N. Logan ; Aug. 17th.

Staff Officers, 3rd Class.—(Air.)—And to be Temp. Capts. while so employed, if not already holding that rank :—Capt. (Temp. Maj.) E. Childers, D.S.C., Lieut. W. S. de Ropp, Lieut. W. G. B. Hayman, Lieut. (Temp. Capt.) L. S., Kiggell, Lieut. G. H. Lyall, Lieut. (Temp. Capt.) H. McClelland, D.S.C., Lieut. (Hon. Capt.) G. M. Part, Lieut. (Temp. Capt.) H. Spink ; Aug. 17th.

The following temporary appointments are made :—

Staff Officers, 1st Class.—(T.)—Capt. (Temp. Maj.) R. K. Pillers, and to be Temp. Lieut.-Col. while so employed ; May 17th. Lieut.-Col. C. Bovill ; July 8th.

Staff Officers, 2nd Class.—Capt. (Hon. Maj.) R. H. Howell, and to be Temp. Maj. while so employed ; April 1st. Maj. J. F. Dyer ; June 8th.

Staff Officers, 3rd Class.—And to be Temp. Capts. while so employed, if not already holding that rank :—Lieut. (Hon. Capt.) E. H. Grant ; April 1st. Sec. Lieut. F. C. Payne ; April 3rd. Lieut. (Temp. Capt.) W. A. Johnson ; May 5th. Lieut. (Temp. Capt.) H. P. S. Clogstoun ; May 18th. Capt. W. Benn, D.S.O. ; July 12th. Capt. R. L. S. Raffles ; Aug. 25th. (P.) Lieut. B. A. Clay ; July 7th. Lieut. A. W. Barnett ; July 15th.

Flying Branch.

Lieuts. to be Temp. Capts. while employed as Capts. (A.) :—C. G. Haynes ; Aug. 19th. J. Oliver ; Aug. 22nd. M. E. Ashton, L. Campbell, V. E. Groom ; Aug. 23rd. H. A. Hay, M.C. ; Aug. 26th. G. B. Bates, R. McLaughlin, (Hon. Capt.) R. L. Whalley ; Aug. 27th. L. Murphy, M.C. ; Aug. 28th. Lieuts. (Hon. Capts.) to be Temp. Capts. while employed as Capts. (S.) :—A. G. Bishop, C. Hanson-Abbott, J. E. A. Hoare, D.S.C., R. Jarman, G. E. Wildman-Lushington ; Aug. 8th.

Lieuts. to be Temp. Capts. while employed as Capts. (S.) :—P. Wickens, J. A. S. Wright, L. G. Wright ; Aug. 8th. Lieut. J. F. Alcock to be Lieut. (A.) from (T.) ; Aug. 12th.

R. Jackson is granted a temp. commn. as Sec. Lieut. (A. and S.) ; July 27th.

The following Flt. Cadets are granted temp. commns. as Sec. Lieuts. (A. and S.) :—J. C. C. Lovelace ; June 25th. F. R. Morgan ; July 28th. F. W. McClive, R. C. Michaelson ; Aug. 17th. W. N. Suckling, V. R. Hicks ; Aug. 18th. H. P. Gardiner, A. Blackwell, H. Pattinson, G. K. Vandervord ; Aug. 19th. J. C. Tyler, H. Stanier, D. Buck, F. G. H. Bar, F. C. Ferrier, W. E. Hele, C. M. Willy, D'A. D. A. Greig, A. E. Robertson ; Aug. 20th. W. S. D. Kinsey, E. B. Fielden, E. B. Appleby, G. C. Rayden, W. J. Nesbitt, A. H. McRoberts, T. Rennie, V. C. Cordingly, J. H. Hill, F. A. R. Berris, T. W. Lazenby, C. E. Goddard, M. Imeretinsky, A. H. Stickle ; Aug. 21st. J. C. Raine, H. E. Harden, C. W. Verity, T. C. McNeale, H. W. Atherton, C. Langley, F. B. McElrea, D. C. Bain ; Aug. 22nd. G. G. Williams, E. A. Rogers, T. G. Brooke ; Aug. 23rd. J. T. Raymond, A. H. Duggan ; Aug. 24th. F. J. Willenberg, R. W. Conway, J. F. Dick, R. A. K. Wiener, C. N. Young, J. A. Le Grange, E. C. Jones, A. R. Sharwood, T. Rothschild, C. W. Wright, F. D. Huggins, H. W Phillipson, S. C. Leith, J. Scholteneyer, J. St. G. B. Nolan, N. D. Spranger, S. N. Bown, J. P. Melrose, J. E. F. Wilkins, A. I. B. Jaussonius, T. H. Buxton, Y. H. M. Crosby, N. Lotter, L. H. Jones, H. J. C. Kelly, P. Rabinson ; Sept. 3rd.

The following Flt. Cadets are granted temp. commns. as Sec. Lieuts. (K.B.) : F. Barrett, F. J. Bell, H. F. Turner ; Aug. 20th.

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts. (Obs. Officers) :—H. Hutchinson, O. L. Rogers, J. G. Dunlop, H. R. Milton ; April 1st. H. T. Cock ; May 26th. W. Middleton ; July 15th. W. R. N. Cheetham, T. J. Birmingham ; July 20th. J. C. Gleave, C. G. Weir ; July 21st. E. F. Boyce, A. W. Robinson ; July 22nd. T. A. Chilcott ; Aug. 1st. G. E. Mackenzie, J. R. Moorhouse, F. R. Atkinson ; Aug. 8th. P. W. Adams, C. S. Frost, R. F. Talbot ; Aug. 10th. E. A. Welsford ; Aug. 14th. H. Shaw, T.T. Eales, J. L. Gess ; Aug. 15th. T. H. Walker ; Agu. 16th. H. Bradbury, F. Player ; Aug. 17th. M. Thorley ; Aug. 26th. R. Henderson ; Aug. 29th.

The following Prob. Obs. Officers (late R.N.A.S.) are granted temp. commns. as Sec. Lieuts. (Obs. Officers) :—F. T. Milton, P. A. Sainsbury, A. Hirschberg ; Aug. 23rd.

The following Flt. Cadets are granted temp. commns. as Sec. Lieuts. (Obs. Officers) :—J. W. Howard, A. E. Amy, G. R. Bartlett, C. Bridgett, B. H. Du Fue, J. T. L. Attwood, C. M. Tupling, R. H. Walker, A. S. Fussell, J. M. Rennie, F. E. West, A. B. Bennett, R. J. Thompson, H. E. Yates, H. C. Bowler, J. W. Brown, J. Sykes, C. E. Gauld, R. W. Symmonds, R. H. Leather, H. W. Howes, G. M. Scarfe, A. C. Bellinger, G. E. O. Dixon, A. W. Green, R. D. Evans, P. N. H. Whitlam, A. S. Wilson, L. E. F. Paxton, L. Arnold, A. Torry, E. J. E. Topham, M. McK. M. McLean, S. A. Beck ; Aug. 23rd. R. H. Kemp ; Aug. 31st. F. F. Bates, N. D. Nunan, E. C. M. Reid, A. McG. Mitchell, J. MacDonald, H. T. Daniel, A. Peak ; Sept. 1st. E. Conning, C. E. Merrett, N. A. Horlock, F. Garrett, F. R. Gibson, A. E. Hole, J. Bolton ; Sept. 2nd.

The following are granted temp. commns. as Sec. Lieuts. (Obs. Officers) :—T. A. Evans (Temp. Lieut., R.W. Fus.), and to be Hon. Lieut. ; April 1st, W. D. Potter (Lieut., Gord. Highrs., T.F.), and to be Hon. Lieut. ; May 20th. W. W. Smith (Temp. Sec. Lieut., Gord. Highrs.), H. Milburn (Temp. Sec. Lieut. W. York R.) ; July 19th. G. G. Travis (Temp. Sec. Lieut., E. York R.) ; July 21st. B. D. Nicholson (Temp. Sec. Lieut., attd. Gord. Highrs.) ; L. C. Tonkin (Temp. Sec. Lieut., attd. Midd'x R.) ; A. C. Vallance (Temp. Sec. Lieut., attd. Sea. Highrs.) ; A. Onthwaite (Temp. Sec. Lieut., attd. W. York R.) ; M. Ryan (Sec. Lieut., E. Lan. R.) ; C. St. C. Stayner (Lieut., N. Brunswick R., C.E.F.), and to be Hon. Lieut. ; July 22nd. M. S. Anthony (Temp. Capt., North'd Fus.), and to be Hon. Capt. A. W. B. Becker, M.C. (Capt., Yorks L.I.), and to be Hon. Capt. ; J. J. Ambler (Temp. Sec. Lieut., North'd Fus.) ; W. T. Barnes (Sec. Lieut., R. Fus.) ; T. Beck, M.C. (Lieut., High. L.I.), and to be Hon. Lieut. ; R. A. Brunton, M.C. (Lieut., Gord. Highrs., T.F.), and to Hon. Lieut. ; W. M. M. Elvery (Lieut., attd. R. Innis. Fus.), and to be Hon. Lieut. V. A. Fair, M.C. (Temp. Sec. Lieut., K.R.R.C.) A. G. Foster-Sutton (Sec. Lieut., E. Kent R., T.F.) F. G. Godsell (Capt., Glouc. R., T.F.) and to be Hon. Capt. A. G. Grant (Sec. Lieut., High. L.I.) ; E. W. Griffin (Lieut., Glouc. R., T.F.), and to be Hon. Lieut. ; A. Lilley (Temp. Sec. Lieut., attd. W. Rid. R.) ; F. J. Mawdesley (Lieut., Cent. Ont. R., C.E.F.), and to be Hon. Lieut. ; G. C. Schofield (Temp. Sec. Lieut., Leic. R.) ; G. Thompson, M.C. (Temp. Sec. Lieut., York and Lanc. R.) ; Aug. 1st. F. N. Billington (Temp. Lieut., A.O.D.), and to be Hon. Lieut ; Aug. 5th. W. T. Mitchell (Temp. Lieut., R. Sc. Fus.), and to be Hon. Lieut. ; Aug. 4th. R. P. Simmers (Lieut., Gord. Highrs., T.F.), and to be Hon. Lieut. ; E. C. Clegg, M.C. (Lieut., Wilts R., S.R.), and to be Hon. Lieut. ; F. C. Cook (Temp. Sec. Lieut., Bedf. R.) ; G. B. Barre (Temp. Sec. Lieut., R. Dub. Fus.) ; E. L. Gilshenan (Temp. Lieut., Glouc. R.), and to be Hon. Lieut. ; Aug. 8th. A. J. C. Gormley (Temp. Sec. Lieut., Tank Corps) ; J. B. Heppel (Lieut., Hereford R.), and to be Hon. Lieut. ; A. M. Barron, M.C. (Lieut., Gord. Highrs., T.F.), and to be Hon. Lieut. ; J. Golding (Temp. Sec. Lieut., W. York R.) ; F. G. Kilby (Sec. Lieut., R. War. R., S.R.) ; Aug. 9th. H. W. Millish (Sec. Lieut., R.F.A., S.R.) ; J. C. H. Hartley, (Sec. Lieut., N. Lan. R., T.F.) ; J. M. Brown (Lieut. D. Corn. L.I., S.R.), and to be Hon. Lieut. ; W. E. Dowling (Capt., E. Lan. R.), and to be Hon. Capt. ; G. H. Fender (Lieut., R.W. Kent R., S.R.), and to be Hon. Lieut. ; Aug. 10th. J. Willson (Sec. Lieut., Lond. R., T.F.) ; Aug. 13th. R. Inglis (Temp. Sec. Lieut., High. L.I.) ; F. L. Wolf (Temp. Sec. Lieut., R. Fus.) ; G. M. Knox (Lieut., Sco. Rif., T.F.), and to be Hon. Lieut. ; J. Carrey (Temp. Sec. Lieut., attd. L'pool R.) ; H. G. Eldon (Sec. Lieut., Lond. R., T.F.) ; Aug. 14th. J. Huntley (Temp. Sec. Lieut., attd. Notts and Derby R.) ; C. S. Griffiths (Temp. Sec. Lieut., R. Ir. Rif.) ; Aug. 16th. A. W. H. Arundel (Lieut., Quebec R., C.E.F.), and to be Hon. Lieut. ; E. B. Andrews (Sec. Lieut., R.F.A., T.F.) ; R. Andrews, M.C. (Lieut., Quebec R., C.E.F.), and to be Hon. Lieut. ; W. A. Briggs (Sec. Lieut., R.G.A., S.R.), A. G. Cumington (Sec. Lieut., R. War. R., S.R.), L. A. S. Harris (Temp. Sec. Lieut., attd. Glouc. R.), S. A. Huggard (Temp. Sec. Lieut., R. Dub. Fus.), F. T. Howell (Lieut., Glouc. R., T.F.), and to be Hon. Lieut. ; W. C. Kidd (Temp. Sec. Lieut., A. Cyclist Corps, S. T. R. Lloyd (Temp. Sec. Lieut., Shrops. L.I.), H. F. Lea (Temp. Sec. Lieut., N. Lan. R.), H. G. Rowe (Temp. Sec. Lieut., L'pool R.), A. C. Simmons (Sec. Lieut., Devon R., S.R.), F. Smith (Sec. Lieut., Lan. Fus., T.F.), J. Walker (Temp. Sec. Lieut., attd. Norf. R.), F. Walsh (Temp. Sec. Lieut., Manch. R.), D. Young (Temp. Sec. Lieut., attd. N. Lan. R.), J. B. Young (Lieut., High. L.I., T.F.), and to be Hon. Lieut. ; Aug. 17th. G. F. Morse (Sec. Lieut., R.F.A., S.R.), E. T. Hunt (Sec. Lieut., R.G.A., S.R.), E. A. Mallet (Temp. Sec. Lieut., attd. Rif. Bde.), W. R. B. Mann (Lieut., R.F.A., T.F.) and to be Hon. Lieut., C. J. M. Turner (Temp. Sec. Lieut., R. Innis. Fus.) ; M. C. Tozer (Lieut., Durh. L.I., T.F.), and to be Hon. Lieut., A. E. White (Lieut., Can. Rly. Services, C.E.F.), and to be Hon. Lieut., T. Whittles (Temp. Sec. Lieut., Manch. R.), E. G. W. Coward (Sec. Lieut., R.F.A., S.R.) ; Aug. 24th. C. G. R. Lewis (Lieut., Durh. L.I., T.F.), and to be Hon. Lieut., N. Offord (Temp. Sec. Lieut., Middx. R.), A. Cooper (Temp. Sec. Lieut., W. York R.), K. P. O. Evans (Sec. Lieut., S. Wales Bord. R., T.F.), G. E. Bates (Temp. Sec. Lieut., attd. Hamps. R.), C. H. Sharp (Sec. Lieut., Norf. R., S.R.) ; Aug. 25th. I. W. F. Agabeg (Lieut., S. Lan. R.), and to be Hon. Lieut. ; L. R. James (Lieut., Brit. Columbia R., C.E.F.), and to be Hon. Lieut., A. W. Palmer (Temp. Sec. Lieut., Tank Corps), G. S. Routhier, M.M. (Lieut., W. Ont. R., C.E.F.), and to be Hon. Lieut., J. V. Scottorn (Temp. Sec. Lieut., Tank Corps) ; Aug. 26th. G. H. Power (Temp. Lieut., Manch. R.), and to be Hon. Lieut., J. H. Adams (Temp. Sec. Lieut., attd. R. Fus.) ; Sept. 1st.

Sec. Lieut. H. C. Petch relinquishes his commn. to resume medical studies and is granted the hon. rank of Sec. Lieut. ; May 18th.

Lieut. C. G. L. Robertson (Sec. Lieut., R.F.A., S.R.) relinquishes his commn. on ceasing to be employed ; July 30th.

Lieut. A. L. Heuther resigns his commn. to resume medical studies, and is granted the hon. rank of Lieut. ; Sept. 4th.

Lieut. A. B. Carmody relinquishes his commn. on account of ill-health, and is granted the hon. rank of Lieut. ; Sept. 4th.

Sec. Lieut. H. J. Jane relinquishes his commn. on account of ill-health, and is granted the hon. rank of Sec. Lieut. ; Sept. 4th

Lieut. S. Hoffman resigns his commn. and is granted the hon. rank of Lieut. ; Sept. 4th.

The following Sec. Lieuts. resign their commns. having been found permanently unfit for further instruction as pilots or observers :—W. Lewis, W. Musson, W. J. O'Sullivan, F. A. Russell, A. D. N. Scott, F. Spurr, E. G. Tye ; Sept. 4th.

The notification in *Gazette*, July 30th, concerning Lieut. (Hon. Capt.) H. G. Hall, D.S.C., to be Obs. Officer, from (A. and S.) is cancelled.

The notification in *Gazette*, Aug. 9th, concerning Sec. Lieut. M. J. Morton is cancelled.

Administrative Branch.

Lieuts. to be Temp. Capts. whilst employed as Capts. :—(Hon. Capt.) W. S. Ford, from (K.B.) ; May 31st. H. P. Tate ; June 1st. V. G. Davis ; June 19th. W. H. Bragg ; June 30th. C. S. Bignell, G. M. Darragh, R. T. Kelly ; July 26th. H. G. Dadley, D.C.M., H. G. Stuart, M.C., J. N. Wilkinson ; Aug. 4th.

Sec. Lieuts. to be Temp. Capts. whilst employed as Capts. :—R. W. Johnson, H. L. Nelson ; Aug. 4th.

Sec. Lieut. (Temp. Capt.) A. Wombwell retains his temp. rank whilst employed as Capt from (T.) ; June 6th.

Sec. Lieut. C. P. Andrews to be Temp. Lieut. whilst employed as Lieut. ; June 19th.

Lieuts. (A.) to be Lieuts. :—S. F. Culver ; July 11th. E. O. L. Bell ; July 27th. L. J. N. Mackay ; Aug. 16th.

Lieut. E. L. Pape to be Lieut. from (K.B.) ; May 31st.

Lieut. J. D. Loraine to be Lieut. from (O.) ; June 19th.

Lieut. (Hon. Capt.) E. J. Cuckney, D.C.S., to be Lieut. (Hon. Capt.) from (S.) ; Aug. 10th.

The following are granted temp. commns. as Sec. Lieuts. :—W. W. Edward, and to be Temp. Capt. whilst specially employed ; Aug. 8th. W. H. Cant ; Aug. 27th. W. J. Root, and to be Temp. Lieut. whilst specially employed ; Aug. 30th. J. J. Brown ; Sept. 1st. H. E. Sugden, F. P. Carroll ; Sept. 2nd.

Capt. I. McA. M. Pender (Capt., Sea. Highrs.) relinquishes his commn. on ceasing to be employed ; Aug. 14th.

Capt. J. J. M. Anderson relinquishes his commission on account of ill-health, and is granted the hon rank of Capt. ; Sept. 4th.

The following Sec. Lieuts. relinquish their commns. on account of ill-health, and are granted the hon. rank of Sec. Lieut. :—P. J. Cardell, J. W. Frechette, W. N. H. Warden ; Sept. 4th.

The following Sec. Lieuts. resign their commissions :—B. L. Banks, F. Boyer, L. P. J. Dion, R. Fisher, J. W. Jameson, O. S. Lieberg, H. C. Pearson ; Sept. 4th.

Technical Branch.

Capt. (Temp. Maj.) R. de Sarigny to be Temp. Lieut.-Col. whilst employed as Lieut.-Col. ; July 12th.

Lieut. (Temp. Capt.) W. W. Hall to be Temp. Maj. whilst employed as Maj. ; Aug. 28th.

Sec. Lieuts. to be Temp. Lieuts. whilst employed as Lieuts. :—J. G. McK. M. Stronach ; June 6th. R. W. Edwards ; Aug. 18th.

Lieut. K. I. Goodman to be Lieut from (Ad.) ; May 31st.

Lieut. T. W. Franks to be Lieut. from (A.) ; Sept. 1st.

Sec. Lieut. A. Ford relinquishes his commn. on account of ill-health, and is granted the hon. rank of Sec. Lieut. ; Sept. 4th.

The following resign their commissions :—Sec. Lieut. E. Bagshaw, Sec. Lieut. J. C. Keen-Hargreaves, Sec. Lieut. H. L. Whitelaw, Lieut. R. H. Whittington ; Sept. 4th.

The initials of the following Temp. Lieuts. are as now described, and not as in *Gazette*, Aug. 16th:—J. F. Lamonby, B. P. K. Walsh.

The notification in *Gazette*, Aug. 13th, regarding Sec. Lieut. (Temp. Capt.) A. E. Fincher is cancelled.

Medical Branch.

The following are granted temp. commns. as Capts.:—R. Hall; Aug. 28th. M. C. Breese, I. de B. Daly; Sept. 1st.

Memoranda.

The following are granted hon. rank of Maj. while employed as Asst. Ch. Insprs., A.I.D.:—Capt. H. Myers; G. S. M. Taylor (Capt., R.E., T.F.), and is granted a temp. commn. as Capt.; Capt. A. A. Ross; G. W. C. Kaye (Capt., R.E., T.F.), and is granted temp. commn. as Capt.; Capt. H. P. Philpot; Sept. 4th.

The following are granted hon. rank of Capt. while employed as Insprs. A.I.D.:—J. A. O'Brien (Lieut., Lond. R., T.F.), and is granted temp. commn. as Lieut.; Lieut. F. Gay, Lieut. L. V. Rothschild, Lieut. W. S. Kellar, Lieut. J. E. Appleyard, Lieut. W. F. Collins, Lieut. E. Fairbrother, Lieut. W. Parr, Lieut. H. T. Wright, Lieut. G. R. Groves; Sept. 4th.

The following are granted temp. hon. commns. as Lieut. whilst employed as Asst. Insprs., A.I.D.:—J. H. Woodruff, T. Kimpton, D. H. Irwin, M. Toombs, W. P. Savage, O. R. Wickham, H. C. Myers, R. Richardson, E. C. Head, A. McIsaac, H. E. Portsmouth, W. Williamson, A. M. Menell, G. H. Tattershall, H. E. White, R. S. L. Bailey, R. Searle, E. D. Burley, C. Newbald, J. Hay, A. E. M. Hunn, P. H. Harrower, C. J. Walters, T. H. Thresh, A. E. Kitsell, F. R. Odder, E. Gough, H. D. Dall, J. E. Haswell, H. H. Gruning, J. P. Tweedy, L. G. Parker, W. L. Macfie, A. H. Simmonds, P. C. Dick, W. G. Edwards, L. W. Atcherley, W. J. Duncan, W. R. V. Morgan, J. B. Mitchell, T. G. Rawson, H. J. Wilkins, C. J. Whall, J. B. Greer, A. Burn, R. E. Tiffin, W. W. Purves, L. S. Rudman, A. E. Marsden, H. S. Wonham, J. Kelly, J. Dixon, A. W. Holden, C. H. Howell, B. Coulam, H. Hey, S. Birley, W. R. H. Arnold, P. H. Ball, H. E. G. Rowley, J. H. Davis, J. J. A. Gilmore, S. J. Norton, G. A. Hopper, H. Tanner, F. S. Holder, A. J. Bohringen, W. C. S. Phillips, F. J. Crinage, C. Watt, H. Taylor, F. E. Coles, E. H. Wilson, F. Butt, F. G. Wedge, W. J. Southwell, C. A. Packer, T. T. Sawday, W. M. Harrison, G. J. Ayling, F. Greenall, T. Spencer, A. R. Woods, M. Paterson, E. Johnson, J. H. Ekins, F. R. Newton, A. J. Marshment, J. L. Manson, W. Ramsay; Sept. 4th.

L. T. M. Pennington is granted a temp. commn. as Hon. Capt.; Sept. 4th.

G. Fineran (late Lieut., R.A.F.) is granted the hon. rank of Lieut.; Aug. 7th.

The notification in the *Gazette* of Aug. 27th concerning Capt. H. A. Porter is cancelled.

Capt. (Temp. Maj.) J. H. C. Minchin relinquishes his appointment as S.O., 2nd Class, and temp. rank; July 14th.

London Gazette, September 6th.

The following temporary appointment is made at the Air Ministry:—

Staff Officer, 3rd Class.—Sec. Lieut. (Temp. Lieut.) A. H. Dawson, and to be Temp. Capt. whilst so employed; Aug. 19th.

The following temporary appointments are made:—

Staff Officer, 2nd Class.—Lieut. (Temp. Capt.) H. J. Lister, and to be Temp. Maj. whilst so employed; June 23rd.

Staff Officer, 3rd Class.—(T.)—Sec. Lieut. C. A. Perry, and to be Temp. Capt. whilst so employed; July 28th.

Staff Officer, 4th Class (1st Grade).—Sec. Lieut. A. K. Spens, and to be Temp. Capt. whilst so employed; Sept. 1st.

Flying Branch.

Lieuts. (Temp. Capts.) to be Temp. Majs. whilst employed as Majs. (A.):—J. O. Galpin, D.S.C., R. Leckie, D.S.C.; Aug. 8th. M. A. Simpson; Aug. 23rd.

Lieuts. (Hon. Capts.) to be Temp. Capts. whilst employed as Capts. (A.):—A. B. Ellwood, H. L. Everitt, F. J. W Mellersh, J. L. A. Sinclair; Aug. 28th.

Lieuts. to be Temp. Capts. whilst employed as Capts. (A.):—N. D. Armstrong, J. F. Byrom, E. D. Clarke, M.C., W. Henderson, H. H. James, W. E. James, M.C., J. F. Larson, B. Monkhouse, S. Wyborn; Aug. 1st. C. F. Falkenburg; Aug. 9th. C. R. R. Hickey; Aug. 13th. C. A. Rea; Aug. 17th. D. Darby; Aug. 22nd. D. M. Darroch, G. A. Wells, M.C.; Aug. 23rd. R. M. Berthe, S. F. H. Thompson, M.C.; Aug. 24th. G. H. Dykes; Aug. 25th. H. D. Barton, W. E. G. Mann; Aug. 27th. D. L. Evans, M.C.; Aug. 30th. F. Woodcock, M.C.; Sept. 1st. C. M. G. Farrell; Sept. 2nd.

Lieut. (Hon. Capt.) J. N. Wilson to be Temp. Capt. whilst employed as Capt. (Dir.); May 20th.

Sec. Lieut. A. J. Moore to be Temp. Capt. whilst employed as Capt. (K.B.); Aug. 23rd.

Lieut. (Temp. Capt.) E. W. Ffrench to be Lieut. (A.), and relinquishes his temp. rank; Aug. 3rd.

Lieuts. (Observer Officers) to be Lieuts. (A. and S.):—B. Morgan; July 28th. E. L. Barrington; July 30th. H. Thomas, G. Gibbs, (Hon. Capt.) H. A. Kelsall, and to be Hon. Capt.; July 31st. G. V. Carter; Aug. 8th. E. R. B. Playford; Aug. 10th. (Hon. Capt.) G. B. Davies, and to be Hon. Capt.; Aug. 12th.

Lieut. J. Tocher to be Lieut. (K.B.), from (Obs. Officer); July 10th (substituted for notification in *Gazette* Aug. 6th).

The following Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in their rank as Sec. Lieuts. (A. and S.):—F. H. Fisher; May 17th. R. C. Pattullo; May 22nd. J. L. Killoran; May 27th. J. V. Coupe; June 1st. F. N. A. Vincent; July 2nd. E. G. Renton; July 3rd. D. A. Martin, J. V. Flanagan, L. H. McHaig; July 6th. W. Hodder, J. M. MacDonald, G. K. Mills; July 9th. S. G. Jary, A. D. MacKenzie, V. O. Knowles; July 11th. W. H. Irvine; July 13th. W. E. Baxter, W. J. Downie; July 14th. W. A. Grant, B. H. Wilson; July 15th. G. C. Lugg; July 17th. W. F. Allen; July 18th. E. Fulford, C. Dean, W. J. Penningroth, E. C. Latto, E. F. D. Gregory, W. Gilbert, G. F. Lane; July 19th. W. K. Gatewood, J. C. Boyle, H. H. Lewis, W. E. Johns; July 20th. J. P. F. English, W. R. Penny, R. W. Kerr, W. Spriggs, J. H. Huxley, A. K. Charlesworth; July 21st. J. H. Cuthbertson, W. F. Maker, J. P. Sharp; July 22nd. C. C. M. Hilditch, J. Haigh, J. E. Mairty; July 23rd. B. S. Philp, W. G. Pearce, S. M. Desmond; July 24th. W. H. Cole; July 25th. W. F. Maker, O. H. Brown, R. I. A. Hickes; July 26th. G. E. Steele, F. C. Annett, H. S. Thomas, A. C. Davern, K. B. Gibb, J. M. McChlery; July 27th. J. R. Roulston; July 27th. P. J. Carr, V. H. Barnfield, J. Scott, R. A. Broadbank, A. D. M. Edwards; July 28th. J. L. Wight, O. H. White, F. E. Winter, G. C. Edmond, T. W. Griffiths, J. H. Macpherson, A. M. Cross, G. King, J. W. Bishop; July 29th. B. J. Dearlove, S. F. Dudley-Smith, G. W. Irving, A. Adam, J. E. Kemp, I. L. Wood, V. P. Donald, S. H. Hughes, C. McLean, J. C. Malcolmson, T. R. Hatton, J. D. Russell, L. Springett, D. C. Rees, C. R. G. Abrahams, R. R. Thompson, S. H. Porter; July 30th. C. E. Francis, S. G. Gordon, N. S. Boulton, M. Marks, R. J. Clench, W. H. C. Gillett, A. J. Goring, P. King, E. Sidey, H. Leadley, C. W. Trimmell, H. R. Cooke, G. R. Moffoot, F. Coleman, L. T. Wilson, S. B. Trites, H. G. Jackson, V. A. Mather, J. G. Newton, L. Dawson, E. P. Clacey, C. L. Lowe, C. Macintyre, R. Ramsey, A. H. Farrington; July 31st. C. T. G. R. Miller, G. W. Ashbrook; Aug. 1st. T. A. Greig, G. A. Chellingworth, R. A. Coulthurst; Aug. 2nd. C. H. Church; Aug. 4th. R. Bramwell, N. A. Talbot, E. L. French; Aug. 5th. F. W. Hatton, C. F. Yokom, W. J. Potts; Aug. 6th. T. Richardson, J. H. Laycock, A. Onions, R. L. McLeod; Aug. 7th. P. J. A. Fleming, T. A. Priestly, S. W. Hedgcock; Aug. 10th. P. F. Cormack, J. R. Chisman, W. K. Rose; Aug. 11th. G. A. Kelly, A. J. Snetsinger; Aug. 12th. J. B. Boyter, W. H. Sawyer, F. W. Radford; Aug. 13th. W. J. Heyland, J. A. Kelyrack, K. L. Gomm, C. C. Fountain, F. Thornton; Aug. 14th.

The following are granted temp. commns. as Sec. Lieuts. (A. and S.):—O. P. Allcock (late Lieut., Dur. L.I.), and to be Hon. Lieut.; May 17th. S. Le R. Switzer; June 26th. G. D. Harle (Temp. Lieut., Rif. Bde.), and to be Hon. Lieut.; July 7th. W. Mackenzie (Capt., N.Z.C.D.), and to be Hon. Capt.; July 13th. J. K. Kempson (Temp. Sec. Lieut., Essex R.); July 14th. L. D. Rosewell (Temp. Lieut., Res. Cav. R.), and to be Hon. Lieut.; H. Kingsbury (Sec. Lieut., R.G.A., S.R.); July 17th. J. Jackson (Temp. Lieut., Norf. R., T.F.), and to be Hon. Lieut., G. Mitchell (Capt., Gord. Highrs.), and to be Hon. Capt.; July 24th. T. S. Millar (Temp. Sec. Liuet., attd. Oxf. and Bucks. L.I.); W. P. A. Robinson, M.C. (Lieut., R.F.A.), and to be Hon. Lieut.; July 27th. J. Wilson (Lieut., Ayr Yeo., T.F.), and to be Hon. Lieut.; J. W. Grant (Lieut. E. Ont. R., C.E.F.), and to be Hon Lieut.; G. A. Burns (Lieut., Manch. R., T.F.) and to be Hon. Lieut.; July 28th. R. J. Bunning (Temp. Sec. Lieut., Rif. Brig.), R. F. Stewart (Sec. Lieut., R.G.A., S.R.), G. O. Wood (Lieut., W. Rid. R., T.F.), and to be Hon. Lieut., J. B. Nelson (Temp. Sec. Lieut., Glouc. R.), T. A. Greig (Temp. Sec. Lieut., attd. Durh. L.I.), J. C. Gunn (Sec. Lieut., High. L.I., T.F.), R. A. Pertus (Lieut., Can. Forestry Corps, C.E.F.), and to be Hon. Lieut.; July 29th. C. Morries (Sec. Lieut., L'pool R., T.F.), J. M. Barlow (Sec. Lieut., L'pool R., T.F.), W. M. Wright (Temp. Sec. Lieut., attd. K.R. Rif. C.), A. C. Anderson (Temp. Sec. Lieut., High. L.I.), L. B. Duggan (Sec. Lieut., Hereford R., T.F.), A. F. Legg (Sec. Lieut., Lond. R., T.F.), W. de Bussey (Temp. Sec. Lieut., York and Lanc. R.), F. D. V. Miller (Lieut., Denbighshire Yeo., T.F.), and to be Hon. Lieut.; July 30th. T. W. A. Ratcliffe (Lieut., Lond. R., T.F.), and to be Hon. Lieut., E. M. Matehew (Sec. Lieut., R.G.A.), W. Gow (Sec. Lieut., R. Scots, T.F.), D. J. MacGowan (Lieut., Scots. Rif., T.F.), and to be Hon. Lieut., J. Nicole (Sec. Lieut., Rif. Brig.), J. Pratt (Sec. Lieut., R.F.A., S.R.), J. D. Muir (Temp. Lieut., High. L.I.), and to be Hon. Lieut., J. Rhodes (Lieut., W. York. R., T.F.), and to be Hon. Lieut., W. J. Kolosoff, M.M. (Lieut., British Columbia R., C.E.F.), and to be Hon. Lieut., L. Belloc (Lieut., R.E.), and to be Hon. Lieut.; G. A. Randolph (Lieut., Som. Yeo., T.F.), and to be Hon. Lieut.; C. R. Sharpe (Temp. Sec. Lieut., Midd'x R.); July 31st. H. H. Heal (Lieut., Quebec R., C.E.F.), and to be Hon. Lieut.; Aug. 4th. C. M. Moore (Temp. Lieut., R. Fus.) and to be Hon. Lieut.; Aug. 7th. F. W. V. Ellvers (Temp. Lieut., R.F.A.), and to be Hon. Lieut.; G. E. Tennant (Lieut., Yorks Hussars Yeo., T.F.), and to be Hon. Lieut.; B. Lockley (Lieut., L'pool R., T.F.), and to be Hon. Lieut.; Aug. 8th. R. H. O'Reilly (Lieut., Can. Engrs.) and to be Hon. Lieut.; Aug. 9th. H. H. Wilson, J. J. Laing (Temp. Lieut., R.F.A.) and to be Hon. Lieut.; Aug. 10th. R. H. F. de V. S. Somerset, D.S.O. (Lieut., C. Gds., S.R.) and to be Hon. Lieut.; Aug. 11th. H. B. Elwell (Lieut., Shrops. L.I., T.F.), and to be Hon. Lieut.; Aug. 12th. R. T. O. Hawthorne (Temp. Sec. Lieut., Durh. L.I.); Aug. 13th. A. V. Farrier (Lieut., D. Corn. L.I., T.F.), and to be Hon. Lieut.; D. D. A. Mackay (Lieut., R.E., T.F.), and to be Hon. Lieut.; Aug. 14th. H. C. Saunders, M.M. (Lieut., British Columbia R., C.E.F.), and to be Hon. Lieut.; C. J. Rhind (Lieut., R.F.A., S.R.), and to be Hon. Lieut.; Aug. 15th. G. W. Birkinshaw; Aug. 21st. C. W. Noel; Aug. 29th, and seniority without pay from June 26th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (A.): M. A. Watts; June 5th. R. L. C. Royle; June 8th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (A. and S.):—C. E. James; June 7th. O. E. Coleman; July 19th. W. A. Deakin; Aug. 6th. D. C. Fleischer; Aug 12th. H. Hammond, J. B. Stockbridge; Aug. 21st. R. Bower, G. W. Hills; Aug. 23rd. A. G. Harrison; Aug. 24th.

The following Prob. Flight Officers (late R.N.A.S.) are granted temp. commns. as Sec. Lieuts. (A. and S.):—T. R. A. May, A. H. Mills-Adams, G. D. Scott, J. W. Taylor; July, 3rd. R. H. Cross; July 5th. F. W. Dodman, H. R. F. Richardson, L. G. Stern, D. P. Brennan, R. C. Pretty, R. H. Rose; July 15th. A. G. White; July 18th. H. Newsham, D. B. McColl, J. R. Smith, G. L. Stroud; July 19th. B. J. E. Anson, H. A. Myott; July 22nd. H. I. M. Monk, D. B. Johnston, W. A. Crick, D. Bancroft-Aitchison, W. A. R. Pepper; July 27th. T. C. Black; July 29th. J. Sellers, H. J. McQueen; July 30th. E. G. Fullerton, J. W. Hartley; July 31st. E. A. Freitag; Aug. 1st. T. D. Vezina, H. Woodruff, C. A. Backeberg, J. C. Bottomley, W. H. Davis, L. V. Russell, L. P. Davies, F. C. Salmon; Aug. 2nd. R. Burgess, E. G. Ralph; Aug. 3rd. L. N. Bissell, G. A. Hodgetts, R. J. Gee; Aug. 4th. J. T. J. McA'Nulty; Aug. 7th. H. J. Bradley, G. Todd; Aug. 8th. C. P. Durkin, E. Sykes, J. C. Sorley, J. M. Stevenson, C. M. Le Moine, J. A. Simmers; Aug. 9th. H. C. Austin, L. P. Worthington; Aug. 10th. F. J. Ellis, G. H. Smyth; Aug. 11th. R. V. Curtis; Aug. 12th. J. E. Mann; Aug. 13th.

H. W. Freshney is granted a temp. commn. as Sec. Lieut. (K.B.); Aug. 20th.

Sec. Lieut. H. G. Hall (formerly 14th L'pool R.) is granted a temp. commn. as Lieut., Obs. Officer, from (A. and S.); May 7th.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (Obs. Officers):—L. R. Chandler, R. N. G. Macey, E. Mason, J. Potter, R. G. Vernon, C. H. Wilcox, G. F. Wilson; Aug. 27th. A. E. Clark, J. S. Ferguson, R. Kelly, A. Fairhurst, W. H. S. Kingsland, Capt. J. Knight, G. A. O'Sullivan, G. Woolf, A. V. W. Church; Aug. 28th. N. Abram; Aug. 29th. R. O. Machin, S. D. A. Partridge, G. L. Parker, F. Buchanan; Aug. 30th. C. McD. de Nobriga, A. B. Macdonald, R. E. Player, F. H. Littman, C. R. Palmear, J. Turnbull, G. Grisdale, S. A. Simpson, O. S. Winfield, J. H. Vickers, E. R. Hargreaves, C. O. Lockey, W. J. Wreford, E. B. Kent, H. S. Cook, H. Lovelady, H. H. Hancock, C. F. Currington, C. Fletcher, W. S. Hedley, F. P. Pitt, L. F. Williamson, C. Radcliffe, M. B. Henselwood, T. R. Young, J. W. Watkins; Aug. 31st. E. Haskins, H. G. Holmes, E. A. Hardman, W. J. Tremellen, R. V. Watson, J. C. Petty, E. Peacop; Sept. 4th.

The following relinquish their commns on ceasing to be employed:—Sec. Lieut. (Hon. Lieut.) J. Garrett (Lieut., Can. Cav. R.); July 10th. Capt. (Temp. Maj.) W. A. Bishop, V.C., D.S.O., M.C. (Capt., Can. Light Horse); Aug. 5th. Capt. R. A. Archer, M.C. (Capt., R.F.A.); Aug 8th. Lieut. A. Richardson (Lieut., Essex Yeo.); Aug. 17th.

Lieut. R. K. Mackenzie relinquishes his commn. on account of ill-health, and is granted the hon. rank of Lieut.; May 4th. (Substituted for notification in *Gazette*, May 3rd).

The following Lieuts. relinquish their commns. on account of ill-health, and are granted the hon. rank of Lieut.:—F. N Grimwade, R. J. Warner; Sept. 7th.

Lieut. L. W. Thompson (Lieut., Midd'x R., T.F.) relinquishes his commn. on account of ill-health contracted on active service; Sept. 7th.

Lieut. J. D. M. Gray resigns his commn.; Sept. 7th.

Lieut. H. G. L. Fletcher relinquishes his commn., having been found permanently unfit for further instruction as pilot or observer; Sept. 7th.

The following Sec. Lieuts. relinquish their commns., having been found permanently unfit for further instruction as pilots or observers:—F. B. Clarke, J. W. Hamel, J. M. Holloway, F. J. Petherick, W. Thompson; Sept. 7th.

The notification in *Gazette*, Aug. 20th, concerning C. Barwell is cancelled.

The notification in *Gazette*, July 9th, concerning S. T. Pye is cancelled.

The notification in *Gazette*, Aug. 23rd, concerning Sec. Lieut. W. L. Dawson is cancelled.

The notification in *Gazette*, Aug. 27th, concerning Sec. Lieut. J. D. Taylor is cancelled.

The notification in *Gazette*, Aug. 23rd, concerning Lieut. C. F. Kelsch is cancelled.

The surname of Sec. Lieut. A. W. Davison is as now described, and not as in *Gazette*, June 28th.

The date of appointment of the following Lieuts. (Hon. Capts.) as Temp. Capts. (A.) is June 5th, and not as in *Gazette*, July 23rd:—J. W. B. Grigson, W. H. Strettel-Miller.

Administrative Branch.

Lieut. (Hon. Capt.) R. E. C. Knight-Bruce to be Temp. Maj. while employed as Maj.; Aug. 28th.

Lieuts. to be Temp. Capts. while employed as Capts. :—(Hon. Capt.) G. Davies, H. Richardson; May 30th. A. McC. Wilson; Aug. 9th.

Sec. Lieuts. to be Temp. Capts. while employed as Capts. :—H. H. Wrong; June 1st. J. Warner-Jones; June 19th.

Sec. Lieuts. to be Temp. Lieuts. while employed as Lieuts. :—S. N. Cooke, A. C. F. Hill; May 15th.

Lieuts. (A.) to be Lieuts. :—(Hon. Capt.) H. G. Ford, and to be Hon. Capt.; May 15th. W. B. W. Clarke; June 27th. A. E. Dyer; Aug. 26th.

Lieut. W. R. W. Henderson to be Lieut., from (A. and S.); Aug. 27th.

Lieuts. (O.) to be Lieuts. :—H. M. Tysoe; April 8th. A. C. Dent, J. M. A. Ewer, H. W. Hill, T. A. M. S. Lewis, M.C.; May 30th.

E. R. Wood (Lieut., Nova Sco. R., C.E.F.) is granted a temp. commn. as Lieut.; July 9th.

Sec. Lieut. V. Lowe (late Gen. List, R.F.C., on prob.) is confirmed in his rank as Sec. Lieut.; April 18th.

The following are granted temp. commns. as Sec. Lieuts., and to be Temp. Lieuts. whilst specially employed :—G. D. G. Hake (Sec. Lieut. ret. pay), R. N. Tweedy; Sept. 2nd.

The following are granted temp. commns. as Sec. Lieuts. :—N. C. Clements, R. G. B. Blanchard, C. G. Butler, C. W. Cornell, H. Dawes, C. Duffy, A. E. Edwards, S. H. Ewins, B. G. Fletcher, G. F. Henderson, F. W. Johnson, E. J. Jordan, D. L. Kane, R. J. Kelso, F. H. Lake, N. W. Lamb, L. M. Lawlor, J. A. Moore, C. C. Newman, H. M. Russell, C. R. Orchard, W. Shaw, J. J. Somerville, T. H. Sutherland, H. G. Wallis, J. W. Warren-Foster, J. W. Watts, P. Webster, C. W. Whitworth; Sept. 2nd.

The following relinquish their commns. on ceasing to be employed :—Capt. (Temp. Maj.) W. H. Horden; Aug. 17th. Sec. Lieut. J. C. Russell, Parsons; Sept. 7th.

Lieut. S. H. W. Gibbs relinquishes his commn on account of ill-health, and is granted the hon. rank of Lieut.; Sept. 7th.

The following Sec. Lieuts. relinquish their commns. on account of ill-health, and are granted the hon. rank of Sec. Lieut. :—A. O. Collins, W. S. Farley, E. I. Levy; Sept. 7th.

Sec. Lieut. G. S. C. Hill relinquishes his commn. on account of ill-health; Sept. 7th.

Sec. Lieut. N. C. Scott resigns his commn. to resume medical studies, and is granted the hon. rank of Sec. Lieut.; Sept. 7th.

Sec. Lieut. R. P. C. Taylor resigns his commn.; Sept. 7th.

The notification in *Gazette*, Aug. 12th, concerning Limbury de Burgh Lewis is cancelled.

The notification in *Gazette*, Aug. 2nd, concerning Sec. Lieut. (Temp. Lieut.) E. R. Wood is cancelled.

Technical Branch.

Maj. C. G. Smith to be Temp. Lieut.-Col. while employed as Lieut.-Col.; June 21st.

Lieut. (Temp. Capt.) E. Holloway to be Temp. Maj. while employed as Maj.; July 22nd.

Lieuts. to be Temp. Capts. while employed as Capts. :—J. B. Crabb, R. W. Mitchell; May 13th. H. G. Thornton, from (O.); Sept. 5th.

Sec. Lieuts. to be Temp. Lieuts. while employed as Lieuts. :—A. E. Fincher-Brookes; July 1st. (Hon. Lieut.) P. J. Whitehead; July 4th.

Sec. Lieut. (Temp. Lieut.) J. E. Tod retains his temp. rank while employed as Lieut., from (S.O.); July 1st.

Lieut. E. N. Holstius to be Lieut. from (Ad.); May 30th.

Lieut. F. Surgey to be Lieut., from (A. and S.); July 16th.

Lieuts. (O.) to be Lieuts. :—D. M. Baird, R. Barnes, M. B. Brown, L. W. Mather, J. L. Morgan, G. D. Morris, W. H. Skinner; May 30th. E. N. Gregory; July 11th.

The following are granted temp. commns. as Sec. Lieuts. :—A. S. Kessler; Aug. 15th. H. D. Staniar, and to be Temp. Lieut. while especially employed; F. A. Grimwood; Sept. 2nd.

Sec. Lieut. A. Ford relinquishes his commn. on account of ill-health, and is granted the hon. rank of Sec. Lieut.; Sept. 7th.

Medical Branch.

The following are granted temp. commns. as Capts. :—W. G. Helsby; Sept. 2nd. A. Bradford; Sept. 4th.

Dental Branch.

A. Williams is granted a temp. commn. as Lieut.; Sept. 2nd.

Memorandum.

Lieut. J. T. Kerr to be Temp. Capt. (without pay and allowances of that rank) whilst employed as Station Adjt.; Aug. 31st.

Royal Flying Corps (Military Wing).

London Gazette Supplement, September 5th.

Assistant Instructor in Gunnery.—(Graded as an Equipment Officer, 2nd Class).—Lieut. M. Tod, R. Highrs., from a Flying Officer, and to remain secd.; March 8th.

Equipment Officer, 3rd Class.—The appointment of Temp. Sec. Lieut. M. Sheriff, D.C.M., Gen. List, notified in *Gazette* of July 3rd, is cancelled.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *Headquarters R.A.F., Independent Force, September 2nd.*

"On the morning of the 2nd inst. our squadrons attacked the hostile aerodrome at Buhl (south-west of Baden) with very good results. Excellent shooting was obtained. Many direct hits were observed on hangars, and a hostile machine on the ground destroyed. All our machines returned safely."

General Headquarters, September 2nd.

"After the heavy rain of Saturday night, the weather improved on Sunday, and our aeroplanes and balloons carried on their work in a clear atmosphere and high wind. In spite of the opposition of enemy machines, over 1,000 photographs were taken by our airmen, and many reconnaissances effected. Contact with our advancing troops was closely maintained. Our observation balloons were constantly pushed forward, and these, with our artillery patrols, kept our batteries informed of numerous targets, which were successfully engaged. Throughout the day, the area in which the Germans were retreating was searched by our low-flying airmen, who everywhere attacked enemy troops and transport with bombs and machine-gun fire, causing heavy casualties and much confusion. Bridges and railway connections were heavily bombed in enemy back areas. In air fighting, eight enemy machines were destroyed and four driven down out of control. Six hostile balloons were brought down in flames by our aeroplanes. Eight of our machines are missing.

"On the following night, bombing was continued both in the zone immediately beyond the battle line and farther east. A German aerodrome beyond St. Quentin was heavily attacked and direct hits observed. We lost one night-bombing machine. During the 24 hours over 34 tons of bombs were launched on different targets. In addition to the hostile machines already reported to have been accounted for on Friday last, our anti-aircraft fire brought down a German night-bombing machine on that date."

War Office, September 2nd.

"*Salonica.*—An enemy aeroplane was shot down in flames near Seres."

Headquarters R.A.F., Independent Force, September 3rd.

"In addition to attacks already reported on hostile aerodrome at Bühl on the morning of the 2nd inst., our squadrons on the afternoon of the 2nd inst. again attacked the same objectives. Very good results were obtained. More hangars were hit and a fire caused. All our machines returned safely. On the night of the 2nd-3rd our squadrons dropped a total of 17 tons of bombs. Bühl aerodrome was again heavily attacked, and the following targets bombed :—The Burbach works, the railways at Saarbrücken and Ehrang, trains, and Boulay aerodrome. Several fires were started at Bühl, three hangars were demolished, and direct hits were obtained on many others. Attack was carried out from 300-900 ft. Over 15 tons of bombs were dropped on this aerodrome in 24 hours. The railways at Ehrang were attacked from a height of 90 ft., and every bomb obtained a direct hit. A fire was started in the Burbach works and very good bursts observed. All our machines returned safely."

General Headquarters, September 3rd.

"On September 3rd (?) our aeroplanes worked all day in front of the advancing battle line, behind which our observation balloons followed closely. Our airmen were frequently attacked by large formations of hostile machines, but persisted in their various tasks. Targets offered by the retiring Germans were reported to our artillery, contact with our infantry and Tanks was maintained, the concentrations of hostile troops and transport along the road were engaged with bombs and machine-guns, hostile anti-Tank guns were silenced, and supplies of small-arm ammunition were dropped to our infantry in the forward zone. Many aerial encounters took place. We destroyed 10 German machines and drove two down out of control. Our missing machines amounted to 20. Twenty-four tons of bombs were dropped during the day and the night following."

Headquarters R.A.F., Independent Force, September 4th.

"On the afternoon of the 3rd inst. our squadrons carried out a most successful attack on the hostile aerodrome at Morhange. Several hangars received direct hits, and two hostile machines on the ground were blown up. Extent of damage confirmed by photographs. All our machines returned safely. On the night of the 3rd-4th inst. our squadrons again heavily bombed the aerodrome at Morhange. Several more hangars were hit, and some fires started. The hostile aerodrome at Boulay and the blast furnaces at Esch (east of Longwy) were also attacked. Direct hits were obtained on the blast furnaces, fires started at Boulay. All our machines returned safely. On the morning of the 4th inst., our squadrons attacked the aerodrome at Morhange, this being the third attack within 24 hours. Excellent shooting was again made, and at least seven hangars received direct hits. All bombs were seen to burst well. One squadron attacked Bühl aerodrome with very good results. All our machines returned safely."

Headquarters, September 4th.

"On September 3rd fine weather, with fair visiblity, enabled our aeroplanes and balloons to co-operate effectively in the advance. The fighting zone and the enemy's back areas were kept under close observation throughout the day. Contact and low-flying patrols were carried out along the battle front, while our artillery machines signalled targets to our guns and reported the effect of their fire. Twenty-one tons of bombs were dropped during the day, and another 21 tons at night. Our airmen destroyed 19 enemy machines and drove seven down out of control. Four enemy balloons were brought down in flames. Ten of our machines are missing."

Admiralty, September 4th.

"During the period August 26th-September 1st, Royal Air Force contingents working with the Navy have carried out successful bombing raids over Ostend-Zeebrugge, and approximately 13 tons of bombs have been dropped with excellent results. Large fires were started; two direct hits obtained on an anti-aircraft battery and many burst in the docks. In home waters anti-submarine reconnaissance and offensive patrols have been maintained. In engagements with enemy machines two were destroyed and another driven down out of control. All our machines returned safely. In the Ægean a constant reconnaissance of the Dardanelles has been maintained. Constantinople was bombed on the night of August 25th-26th. The aerodrome at Galata and the seaplane base at Gallipoli and Chanak were also heavily bombed by British machines in co-operation with a Greek unit. Constantinople was again bombed on the night of August 27th-28th with good results. The attack was directed against the arsenal and dockyard on the Galata-Pera side; the War Office and barracks adjoining on the Stambul side. One of our machines failed to return."

War Office, September 4th.

"*Salonica.*—On September 2nd two hostile aeroplanes were destroyed.

"*Palestine Front.*—Since August 14th activity has in the main been confined to aerial bombing raids against the enemy establishments on the Hedjaz Railway patrol encounters east of the Jordan, and raiding enterprises against the enemy advanced lines."

General Headquarters, September 5th.

"Much reconnaissance and photographic work was accomplished by the Air Force on September 4th, and a large number of artillery and contact patrols were carried out. The weight of bombs dropped by us during the day was 23 tons. No bombing was possible after dark. Enemy machines working in large formations on the German side of the lines showed considerable activity. Twenty-five hostile machines were brought down by our airmen, and no less than nine balloons were shot down in flames. In addition, 14 hostile machines were driven down out of control. Sixteen of our machines are missing. One of our machines reported as missing in the fighting of September 2nd has since returned. In the course of the weeks which have elapsed since the commencement of our offensive on August 8th, 465 enemy machines have been brought down by our airmen, their destruction being in every case clearly established. In addition, the total of enemy machines proved to have been driven down out of control (many of which must have actually crashed) is exactly 200. The above figures are exclusive of the considerable number of enemy machines brought down by gun fire from the ground. Sixty-one German balloons have been set on fire; 911½ tons of bombs have been dropped by us. Practically the whole of the air fighting has taken place on the enemy's side of the line. The number of our machines which have failed to return during this period is 262."

General Headquarters, September 6th.

"On September 5th the weather was fine, but rather cloudy. Our aeroplanes and balloons were able to work throughout the day, reporting the enemy's movements and dispositions, photographing his defences, harassing his troops with machine-gun fire and bombs, and observing the fire of our artillery. Enemy aircraft, flying in large formations on the German side of the line were active

at times, especially in the Cambrai region. Twenty-three hostile machines were destroyed in air fighting, and 14 others were driven down out of control. Three German balloons were brought down in flames. Thirteen of our aeroplanes are missing. During the day 21 tons of bombs were dropped by us on various targets. No flying was possible at night."

Headquarters R.A.F., Independent Force, September 7th.

"On the night of the 6th-7th inst. our squadrons carried out attacks against two hostile aerodromes. Fires were caused, but observation of results was hindered by weather conditions, as were operations generally. All our machines returned. On the morning of the 7th inst. our squadrons attacked the railways at Ehrang and the chemical works at Mannheim. Good bursts were observed on and beside the railway lines at Ehrang. Fierce opposition was met with in the raid on Mannheim, but, despite this, the objective was reached and successfully bombed. Eight direct hits and many other good bursts were observed on the chemical works. Our squadrons fought largely superior numbers of enemy aeroplanes both before and after reaching the objective. One squadron had a hard, continuous fight for a distance of 70 miles before reaching its objective, and the fight continued for another 70 miles on the way back. Over 2 tons of bombs were dropped on Mannheim. As a result of the fighting one enemy aeroplane was destroyed, and two more hostile machines were driven down out of control. Four of our machines are missing."

General Headquarters, September 7th.

"Eleven German aeroplanes were brought down on September 6th in air fighting and 12 driven down out of control. One enemy balloon was destroyed. Five of our mahinesc are missing. Observation for the artillery was continued both by aeroplanes and balloons. Some valuable reconnaissances were carried out by our machines and a large number of photographs were taken, while our balloons reported much useful tactical information. During the day and the following night 32 tons of bombs were dropped by our airmen, the railway connections at Armentières, Lille, Douai, Denain, Cambrai, and St. Quentin being heavily attacked. All our night-flying machines have returned."

General Headquarters, September 8th.

"Clouds and rain-storms limited work in the air on September 7th, but a good deal of artillery observation was carried out, as well as reconnaissances and contact patrols. Eight hostile machines and one balloon were destroyed by our airmen. Three of our machines are missing. Thirteen tons of bombs were dropped by us during the 24 hours. Our night bombing machines all returned safely."

War Office, September 8th.

"*Italian Front.*—Nothing of interest has occurred on this front since my last report. Hostile artillery has shown diminished activity. Since August 25th eight enemy aircraft and one captive balloon have been destroyed. One of our machines is missing."

General Headquarters, September 9th.

"On September 8th the sky was overcast and there were frequent rainstorms with high wind. Our aeroplanes carried on their work for the artillery with difficulty, and also accomplished a number of reconnaissances and contact patrols. Five tons of bombs were dropped during the day. There was no flying at night. The activity of the enemy's machines was very slight, but we brought down five and drove two down out of control. None of our machines are missing."

War Office, September 9th

"*Salonica.*—On September 3rd six of our scouts, engaging an equal number of enemy machines near Lake Doiran, crashed four of them. Another hostile aeroplane was destroyed near Rupel on September 4th, and an enemy observation balloon was brought down behind our lines on the 3rd inst. In the Struma Valley, on the night of September 7th-8th, the Greek outpost line was advanced, without enemy opposition, to the general line Kakaraska-Kalendra-Haznatar."

French. *Paris, September 2nd.*

"The bad weather hindered aerial operations during the day of September 1st. Nevertheless, four enemy aeroplanes were shot down and one captive balloon set on fire. Our reconnoitring aeroplanes in the course of their expeditions carried out several bombardments in the region of La Fere. Convoys on the road system round St. Quentin and La Fere were machine-gunned. During the night nearly 10 tons of bombs were dropped on railway stations, and in particular on those of Marles, Laon, and Ham, causing fires. In addition, 8 tons of projectiles were dropped on the bivouacs in the region of Villers-Franqueux and on the railway stations of Maison Bleue and Cignicourt. On the latter railway station alone 4½ tons of projectiles were dropped, causing heavy damage."

Paris, September 3rd.

"During the day of September 2nd, favoured by the fine weather, our Air Service displayed particular activity on the whole front and carried out important work. Our observers made numerous reconnoitring expeditions over the enemy's lines and took some hundreds of photographs. In the battle zone our infantry aeroplanes marked the advance of our troops, located the enemy's forces and batteries in action, and in conjunction with the artillery co-operated in the destruction of the enemy's centres of resistance. Very many fights took place, in the course of which 19 enemy aeroplanes were shot down or put out of action, and nine captive balloons set on fire in particularly perilous conditions. Our bombing aeroplanes, in the course of expeditions carried out during the day, dropped over 13 tons of bombs on the regions of Chavignon, Anizy, and Brancourt. During the night, in spite of the cloudy weather, our bombers continued their work. Sixteen tons of projectiles were dropped on the railway stations, bivouacs, and railways in the enemy's back areas. The railway station at Flavy-le-Martel alone received 6 tons. Two violent fires broke out as the result of this bombardment. Three tons dropped on the cantonments of the region of Jussy and 4 tons on the railway stations of Guignicourt and Maison Bleue gave excellent results. In addition, our bombers used several thousand rounds on the enemy's bivouacs."

"*Balkans.*—Allied airmen bombed the railway stations and encampment in the region of Hudovo-Ghevgueli and depots in the Struma valley. Two enemy machines were driven down in air fighting, one near Hudovo by French airmen, the other near Seres by British airmen."

Paris, September 4th.

"*Balkans.*—British airmen bombarded the station of Miletkovo and were engaged in several aerial combats. One enemy machine was brought down and four others were driven down out of control."

Paris, September 5th.

"*Balkans.*—British airmen bombarded camps in the Vardar valley and shot down an enemy biplane."

Paris, September 6th.

"*Balkans.*—French and British airmen bombed the enemy organisations in the Vardar valley."

Paris, September 8th.

"*Balkans.*—French and British airmen bombed enemy encampments in the regions of Monastir and Struma."

There was activity on the whole of the front, especially west of the Vardar, in the Tcherna bend, in the region of Monastir, and between the Lakes, where the enemy attempted a raid which collapsed, and cost him heavy losses. In Albania there were patrol encounters."

U.S.A.

"Yesterday our airmen successfully bombed the railroad yards at Longuyon, Dommary, Baroncourt, and Conflans."

Italian. *Rome, September 2nd.*

"During the day the enemy's front lines were repeatedly attacked with success by our and Allied airmen. A powerful Italian flight flying to the east of Livenza bombarded with visible results a hostile aviation camp. Numerous enemy machines which arose to fight were dispersed by our escorting planes."

Rome, September 4th.

"In the afternoon of September 1st an enemy aeroplane was brought down and another forced to land."

Rome, September 7th.

"*Albania.*—On the 5th and 6th Italian naval machines and British aeroplanes carried out several bombardments, inflicting losses and damage on the enemy."

Rome, September 8th.

"Our flights dropped 2 tons of bombs on the sheds and machines of the hostile aviation camp near Belluno. Other reconnoitring flights ran through up and down the Gail and Drava Valleys, and flying very low dropped bombs with great accuracy on the Villach and Lienz railway stations."

Belgian. *Havre, September 4th.*

"Sub-Flight Lieut. Coopens on September 3rd and September 4th set fire to two enemy balloons, thus achieving his 29th and 30th victories."

Havre, September 6th.

"Our artillery brought down an enemy aeroplane."

German. *Berlin, September 3rd.*

"Yesterday we shot down 13 enemy balloons and 55 aeroplanes, 36 upon the Arras battlefield, and of these 26 were brought down by Chaser-Squadron No. 3 under the leadership of First Lieut. Lörzer. First Lieut. Lörzer thereby achieved his 35th aerial victory."

Berlin, September 4th.

"Yesterday we shot down 32 enemy aeroplanes and seven captive balloons. Lieut. Rumey achieved his 30th aerial victory."

"Berlin, September 4th.

"Yesterday we shot down 32 enemy aeroplanes."

Berlin, September 9th.

"Five aeroplanes were brought down out of an English squadron which advanced to the attack. In August, on the German fronts, 565 enemy aeroplanes were brought down, 62 of them by our anti-aircraft guns and 52 captive balloons. Of these, 251 aeroplanes are in our possession. The rest were observed to fall on the other side of the enemy lines We lost in battle 143 aeroplanes and 86 captive balloons."

Austrian. *Vienna, September 8th.*

"On the Italian front there has been very lively aerial activity."

More Protests by Holland.

IT is stated that the Dutch Minister in London has been instructed to protest to the British Government against various violations of Dutch territory by British aeroplanes.

Leaflets by Balloon.

ACCORDING to a report received by the *North German Gazette* from Eschwege, a small balloon without a gondola drifted over the village of Malkomes, in the district of Cassel, dropping French pamphlets entitled "Mr. Balfour's Reply to Count Hertling."

German Aeroplanes after Tanks.

WRITING on September 3rd, Reuter's correspondent at the British Headquarters says such fighting aeroplanes as the Germans have employed have been almost wholly devoted to anti-Tank work, particularly by night, when they constantly cut off their engines to try and detect the grinding of the tractors, and then drop brilliant parachute lights, so as to see where to bomb.

German Seaplanes Off the Syrian Coast.

TWO patrol vessels belonging to the French Naval Division off the Syrian coast were attacked on four occasions during the morning of August 28th by a squadron of enemy seaplanes. The patrols returned their fire, hitting one of the seaplanes and damaging it.

The Kaiser and the Zeppelin.

IN his series of articles in the *Times* on "The Kaiser as I knew Him," Mr. Arthur N. Davis, the Emperor William's American dentist, throws a sidelight on the attitude of the "All-highest" towards the Zeppelins. He says:—

"The failure of the Zeppelins from a military standpoint was undoubtedly a great disappointment to the German people at large, who had counted so much upon them to bring disaster to England, but it cannot be said that the Kaiser shared their chagrin. On the contrary, I have reason to believe that he never expected very much from that arm of his military force except as it might be useful to terrorise the civil population. A day or two after Zeppelin's death, in 1917, a patient of mine, a lady, happened to remark that it was too bad that the Count had not lived to see the triumph of his invention, and when I saw the Kaiser shortly afterwards I repeated her remark to see what he would say.

"'I am convinced that the Count lived long enough to see all that the Zeppelins were capable of accomplishing,' was his only comment. It recalled the answer he had given me some years before when both Zeppelins and aeroplanes were in their infancy, and I had asked him which held the greater promise. 'We do not know. Time alone will tell,' was his reply."

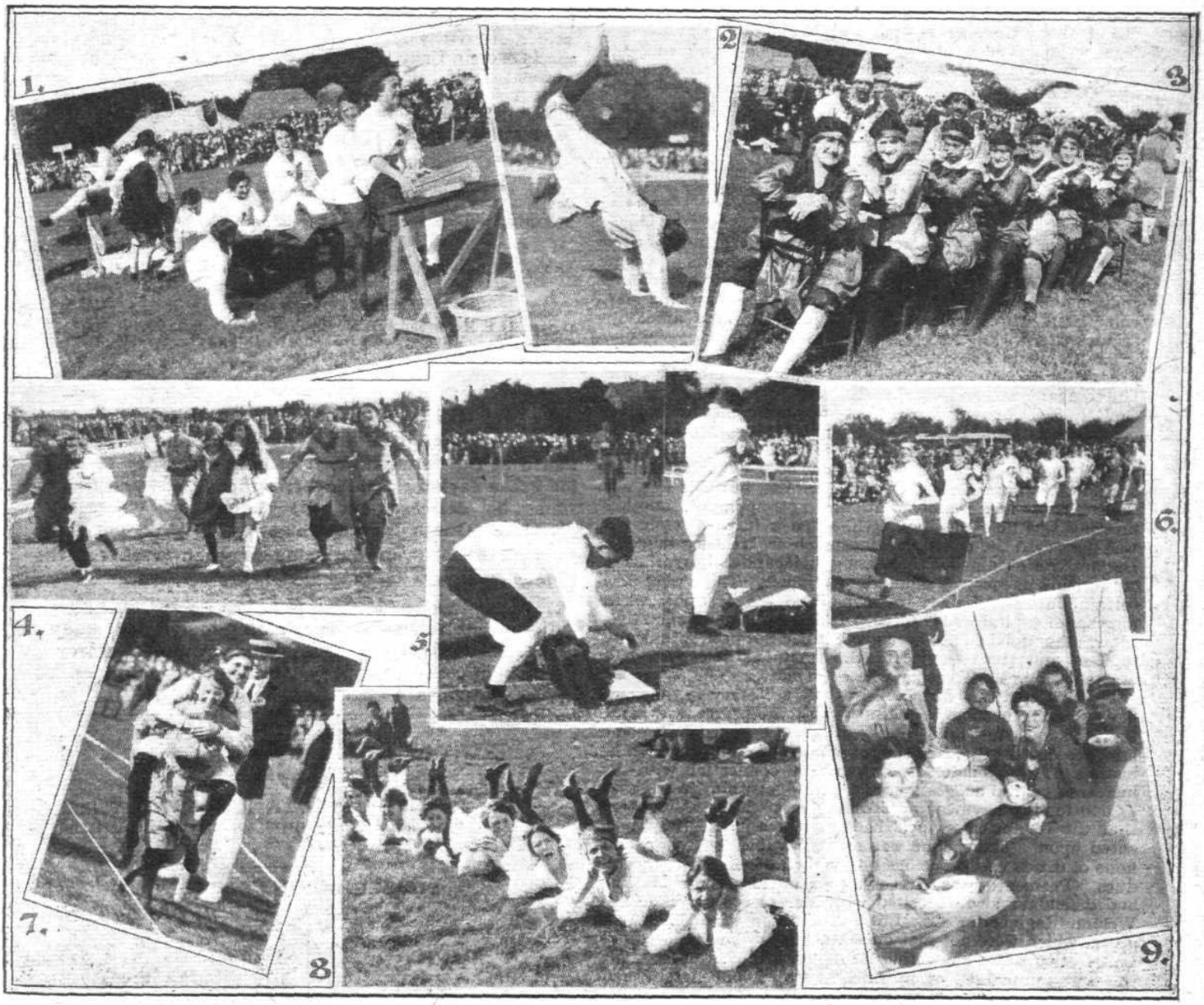
FLIGHT

LEISURE HOURS.

SOMETHING for everybody would seem to have been the aim of the committee which organised the sports of Aeroplane Factory No. 1 held on Saturday last. For those who were not attracted by the sports there was plenty of amusement and entertainment. Pierrots, a band, the remnants of an harlequinade—two clowns and a policeman—with the inevitable Charlie Chaplin, all helped to pass the time pleasantly, while for those who felt vigorous a few skipping ropes, with some expeditionary force men to do the turning, were provided and did good business. As regards the sports most of the events were closed, and the ladies certainly could not say that they did not have a fair share. Some very fine running was seen, and the competition generally was very keen.

THE R.A.F. was well to the fore at the British Empire and American Services Sports at Stamford Bridge on Saturday. Their team won in the tug-of-war, beating the New Zealanders, the Australians, and a British Army team largely made up of Irish Guardsmen—worthy foes indeed. Lieut. Frazer, R.A.F. shattered the hopes of the Australians in the 120 yards hurdle race, and beat Pellew after a splendid tussle in 16⅘ sec. The R.A.F. team won in the mile relay race, the fine work of Capt. F. de B. Collinette over the half-mile being largely responsible for the result. The mile relay race for the Women's Auxiliary forces was carried off by a W.R.A.F. team.

So successful has the scheme of staff promotion and education started by the Dunlop Rubber Co. last January proved that it is proposed to extend the idea to the mill staff and to those on the clerical staff who do not at present come under its benefits. At the prize-giving on September 6th Mr. F. C. Baisley explained that the policy of the directors was to secure and retain the services of men and women and boys and girls of ability and encourage them to advance. With the large staff which they employed in various parts of the world the scope for advancement was very wide, and the Dunlop scheme afforded the strongest possible inducement to study with the prospect of constantly increasing salaries, a satisfactory career and, for the male workers, the benefit of insurance endowment at the age of 55. Of the 200 who took up the scheme this year 120 had won prizes. Distributing the prizes the Lord Mayor, Sir David Brooks, congratulated both the company and the employees on the success of a pioneer scheme, and said he would like to see it deve'oped and adopted by other large commercial undertakings. During the evening the Dunlop Staff Choir, conducted by Mr. C. F. Lees, rendered a very good programme of musical items.



NO. 1 AEROPLANE FACTORY SPORTS.—A few "incidents" during Saturday afternoon:—1. Over-weighted with competitors the pole broke. 2. One way of expressing delight at the success in the tug-of-war of her team. A lively competitor celebrates it by turning a cart-wheel. 3. Chairs well in demand, while waiting for the next event. 4. Three-legged race in full swing. 5. Week-end race for men who had to run to a bag, dress in what they found in it, and then return to the starting point. 6. The half-mile open handicap snapped soon after start. 7. "Pick-a-back." A special race for the photographer, who snapped the winner. 8. Watching the tug-of-war by another team in waiting. 9. A corner of the tea tent, where ices were in great demand.

SIDE-WINDS.

IT has been decided that, from now onwards, the word "aviation" should be omitted from the title of the enterprises which Mr. Claude Grahame-White controls, and that the company which bears his name should be known in future simply as "The Grahame-White Company, Ltd." This step has been taken for two reasons. In the first place, the name of the company is so well identified with aeronautics that any specific reference, in its title, to the work on which it is engaged has now become superfluous; and, in the second place, the word "aviation," which suggests the art of flying itself rather than the whole of the science and industry of aeronautics, has therefore become too narrow in its implication.

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FROM Messrs. Accles and Pollock, Ltd., of Oldbury, Birmingham, comes a catalogue of special sections of weldless steel tubing for aeroplanes and for other purposes. This gives illustrations of the sections and also lists of dimensions, including areas, weight per foot, &c. This is a most useful book and Messrs. Accles and Pollock will be glad to send a copy to anyone really interested if they will send their trade card.

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APART from particulars of tubes, &c., the Accles and Pollock catalogue has one or two specialities which will be useful about the works, such as micrometer frames—made from weldless steel tubing, of course—Apollo mykarms, the invention of a British Government Inspector, and a stand for fixing to the bench for holding a micrometer. By the aid of the stand the "Apollo" mykarms can be used as a limit gauge by means of the pressure of the foot, both hands being then free for picking up pieces to be examined.

LEGAL INTELLIGENCE.

A Charge of Perjury.

AT the Guildhall on Monday, before Alderman Sir Alfred Bower, Robert Taylor, of Old Broad Street, promoter of a company called Associated Aircrafts, Ltd., appeared to a summons charging him with having, on three dates in the present year, committed wilful and corrupt perjury in three affidavits sworn by him.

Sir Archibald Bodkin, in opening the case, stated that the prosecutor was Mr. Panajotic Demetrino Baronnos, a Greek The company was registered in October, 1917, with a nominal capital of £25,000, divided into 10,000 preference and 15,000 ordinary shares. Defendant was managing director. On February 26th last, at a meeting, it was resolved that the capital should be increased to £1,000,000. That resolution should have been filed at Somerset House, but this was not done. For some reason that was not apparent, another meeting was held on May 15th, when a further resolution was passed to the effect that inasmuch as Treasury sanction had not been obtained for increasing their capital the resolution authorising its increase should be rescinded. There were now certain duties and dues to be paid to the Treasury when increase of capital was granted. It should be mentioned that though sanction had not been given it had not been specifically refused, and since service of the summons defendant had written asking the Treasury where the matter stood.

It was stated that Mr. Cecil Nathan, secretary to the company, having become acquainted with the prosecutor, came to the knowledge that that gentleman had recently come into possession of a large sum of money, and on May 26th he made a proposition to Mr. Baronnos in connection with the increased capital suggestion, and he induced him to advance £5,000 for the payment of Treasury fees on the assumption that the resolution—which had been rescinded—would be acted upon. The cheque was made payable to Taylor, and none of it was used in connection with the increase of capital dues. Prosecutor was to receive £500 for the accommodation, and defendant also deposited with him 12,450 shares in the Weldon Engineering Co., Ltd., in addition three bills were given, which were not met on maturing. When proceedings were instituted for recovering the money he put in an affidavit, the first complained of, in which he stated that plaintiff had acted in breach of agreement by presenting the bills whilst negotiations were pending.

Other affidavits were read, when Sir Richard Muir, counsel for the defence, said as the case must be adjourned he should say at once that the defence was that the statements alleged to be perjury were in fact true, and that the whole matter was due to a misunderstanding.

Formal evidence was given, and the proceedings were adjourned.

COMPANY MATTERS.

NEW COMPANIES REGISTERED.

Private Company.

ALLAN JONES AND CO. (1918), LTD., 10, Fenchurch Buildings, E.C.—Capital £30,000, in £1 shares. Acquiring business carried on by Allan Jones and Co., Ltd., at Hatherley Works, Gloucester, manufacturers of and dealers in wooden and metal goods, &c., also manufacturers of and dealers in aeroplanes and accessories, erectors of hangars, &c. First directors: G. H. Humphrey and R. H. P. Bleakley.

OFFER ENGINEERING WORKS, LTD., 22, Union Street, Kingston-on-Thames.—Capital £25,000, in £1 shares (15,000 "A" and 10,000 "B"). Acquiring business of aviation engineers, carried on by Messrs. Offer and Sons at Union Street, Kingston-on-Thames. First directors: J. M. Dwelly and Mrs. V. I. Offer and H. J. Offer (managing director).

MORLEY AVIATION CO., LTD., 1, Renfrew Road, S.E. 11.—Capital £1,000, in £1 shares. Aeroplane, aircraft and piano manufacturers, wood workers, &c. First directors: E. J. Dunn, S. F. Dunn, Jessie A. Forecast, Elizabeth A. Mundy and A. Staples.

POMEROY'S, LTD., 4, Pomeroy Row, Edmonton, N.—Capital £10,000, in 9,000 ordinary shares of £1 each and 20,000 deferred shares of 1s. each. Acquiring business and assets of Aero Undertakings, Ltd., all the letters, patent, provisional specifications, inventions (whether protected or not) and recipes of medical cures of John Pomeroy. First directors: J. Pomeroy (governing director), C. Heath, G. F. Woodger and Amelia Pomeroy.

Aeronautical Patents Published.

Abbreviations:—cyl. = cylinder; I.C. = internal combustion; m. = motors.

Applied for in 1918.

The numbers in brackets are those under which the specifications will be printed and abridged, &c.

Published September 12th, 1918.

11,534. R. S. MASON and A. E. MARTIN. Magnetic compasses. (118,139.)
11,544. W. T. WARREN and M. G. and W. D. SMILES. Sparking control of aviation engines. (118,140.)

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